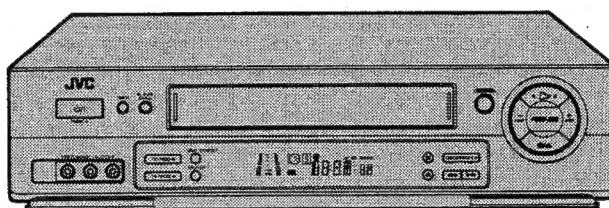
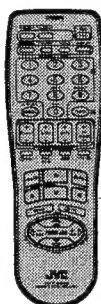


JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J655EA



G-CODE

Hi-Fi



PAL NTSC

Regarding service information other than these sections, refer to the HR-J657MS service manual (No. 82686).
Also, be sure to note important safety precautions provided in the service manual. +V22196

SPECIFICATIONS

GENERAL

Power requirement	: AC 220 – 240 V~, 50/60 Hz
Power consumption	: 24 W
Temperature	
Operating	: 5°C to 40°C
Storage	: -20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 401 x 94 x 340 mm
Weight	: 3.8 kg
Format	: VHS standard
Maximum recording time (SP)	: 240 min. with E-240 video cassette (PAL/MESECAM)
	: 160 min. with T-160 video cassette (NTSC)
(LP)	: 480 min. with E-240 video cassette (PAL/MESECAM)
(EP)	: 480 min. with T-160 video cassette (NTSC)

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
	: NTSC colour and EIA monochrome signals, 525 lines/60 fields
Recording system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB

Horizontal resolution	: 250 lines (PAL/MESECAM)
	: 220 lines (NTSC)
Frequency range	: 70 Hz to 10,000 Hz (Normal audio)
	: 20 Hz to 20,000 Hz (Hi-Fi audio)
Input/Output	: RCA connectors (IN x 2, OUT x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF (Low) 42 – 175 MHz
	: (High) 175 – 470 MHz
	: UHF 470 – 870 MHz
Aerial output	: UHF channels (Adjustable E28 – E60)
Memory backup time	: Approx. 6 months
	: Estimated figure based on supplied fresh battery; actual performance may differ.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6/UM-3" battery x 2, Lithium battery CR2025
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*Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.*

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The following table indicate main different points between models HR-J657MS and HR-J655EA.

ITEM	MODEL	HR-J657MS	HR-J655EA
AUDIO DUBBING		NOT USED	USED
STEREO DECODER		NOT USED	NICAM/A2
G-CODE		NOT USED	USED

The following table indicate different parts number between models HR-J657MS and HR-J655EA.

PACKING AND ACCESSORY ASSEMBLY <M1>

REF. NO.	ITEM	MODEL	HR-J657MS	HR-J655EA
301	PACKING CASE		LP30423-035A	LP30423-025B
△ 310	INST.BOOK(EN.CH)		LPT0109-001A	LPT0106-001A
△	INST.BOOK(RU.AR)		LPT0109-002A	—
316	WARRANTY CARD		—	BT-56001-1
318	SER.NET CARD		—	BT-56002-1

CABINET AND CHASSIS ASSEMBLY <M2>

REF. NO.	ITEM	MODEL	HR-J657MS	HR-J655EA
△ 550	FRONT PANEL ASSY		LP10125-014E	LP10125-016E
550A	CASSETTE DOOR		LP20342-016B	LP20342-012B
550C	DISPLAY WINDOW		LP20343-016A	LP20343-013A
△ 551	TOP COVER		PQ11676-51	PQ11676-49
△ 571	POWER CORD		QMP4A10-170	QMP2990-220

Notes : Mark — is not used.

MAIN BOARD ASSEMBLY <03>

△ REF. NO	ITEM	MODEL	HR-J657MS	HR-J655EA
PW1	MAIN BOARD ASSY		LPA10014-12B	LPA10014-15A
IC201	IC		LC74789N-9718	LC74788N-9705
Q2061	TRANSISTOR		—	2SC4081/QRS
Q2062	TRANSISTOR		—	DTA114EUA
Q2063	TRANSISTOR		—	DTC144WUA
Q4001	TRANSISTOR		—	DTC114EUA
Q6033	TRANSISTOR		UN5211	—
Q6035	TRANSISTOR		UN5211	—
R2053	MG RESISTOR		NRSA02J-822X	NRSA02J-562X
R2054	MG RESISTOR		NRSA02J-123X	NRSA02J-153X
R2056	C RESISTOR		QRE141J-820Y	QRE141J-101X
R2061	MG RESISTOR		—	NRSA02J-273X
R2062	MG RESISTOR		—	NRSA02J-3R3X
R2063	MG RESISTOR		—	NRSA02J-151X
R5101	C RESISTOR		QRE141J-224Y	QRE141J-334Y
R5102	C RESISTOR		QRE141J-224Y	QRE141J-334Y
R5108	MG RESISTOR		NRSA02J-152X	NRSA02J-222X
R6035	MG RESISTOR		NRSA02J-105X	—
R6039	MG RESISTOR		NRSA02J-105X	—
C2052	F CAPACITOR		QFV61HJ-823	QFLC1HJ-333
C2053	CAPACITOR		NCB21HK-472X	NCB21HK-332X
C2054	CAPACITOR		NCB21EK-223X	NCB21HK-103X
C2061	F CAPACITOR		—	QFLC1HJ-333
C2062	CAPACITOR		—	NCB21HK-332X
C2063	CAPACITOR		—	NCB21HK-103X
C2064	E CAPACITOR		—	QEKJ1CM-106
C4014	CAPACITOR		—	NCB21EK-223X
C5006	E CAPACITOR		QEZ0374-826	QEZ0374-686
C6014	CAPACITOR		NCB21EK-473X	NCB21CK-473X
C6036	CAPACITOR		NCB21HK-682X	—
T2051	OSC TRANSFORMER		PELN0832	PELN0860
T2052	OSC TRANSFORMER		—	PELN0861
TU6001	TUNER		QAU0084-001	QAU0082-001

Notes : Mark — is not used.

SW/DISPLAY BOARD ASSEMBLY <28>

REF. NO	ITEM	MODEL	HR-J657MS	HR-J655EA
PW1	SW/DISPLAY BOARD ASSY		LPA10018-18A1	LPA10018-20A1
R7010	C RESISTOR		—	QRE141J-153Y
R7012	C RESISTOR		—	QRE141J-153Y
R7052	C RESISTOR		QRE141J-393Y	—
R7053	C RESISTOR		—	QRE141J-393Y

DEMODULATOR BOARD ASSEMBLY <14>

△ REF. NO	ITEM	MODEL	HR-J657MS	HR-J655EA
PW1	DEMOD BOARD ASSY		—	LPA10030-01B

Notes : Mark — is not used.

SECTION 3 ELECTRICAL ADJUSTMENT

3.6 DEMODULATOR CIRCUIT

Note: • The adjusted value of 2.05 Vp-p is a reference value which should be obtained during external S input. The value should be adjusted to the one which was confirmed at step (2).

3.6.1 Stereo Separation

Signal	• Sweep generator output (90 dB, 1 kHz)
Mode	• EE
Equipment	• Oscilloscope
Measurement point	• CN6701-pin 8
Adjustment part	• VR6701 (SEPARATION 1)
Specification	• Minimum level

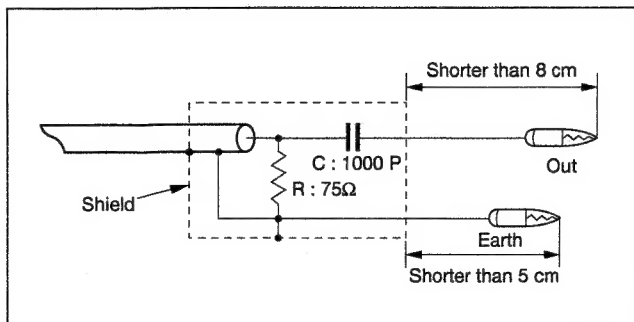
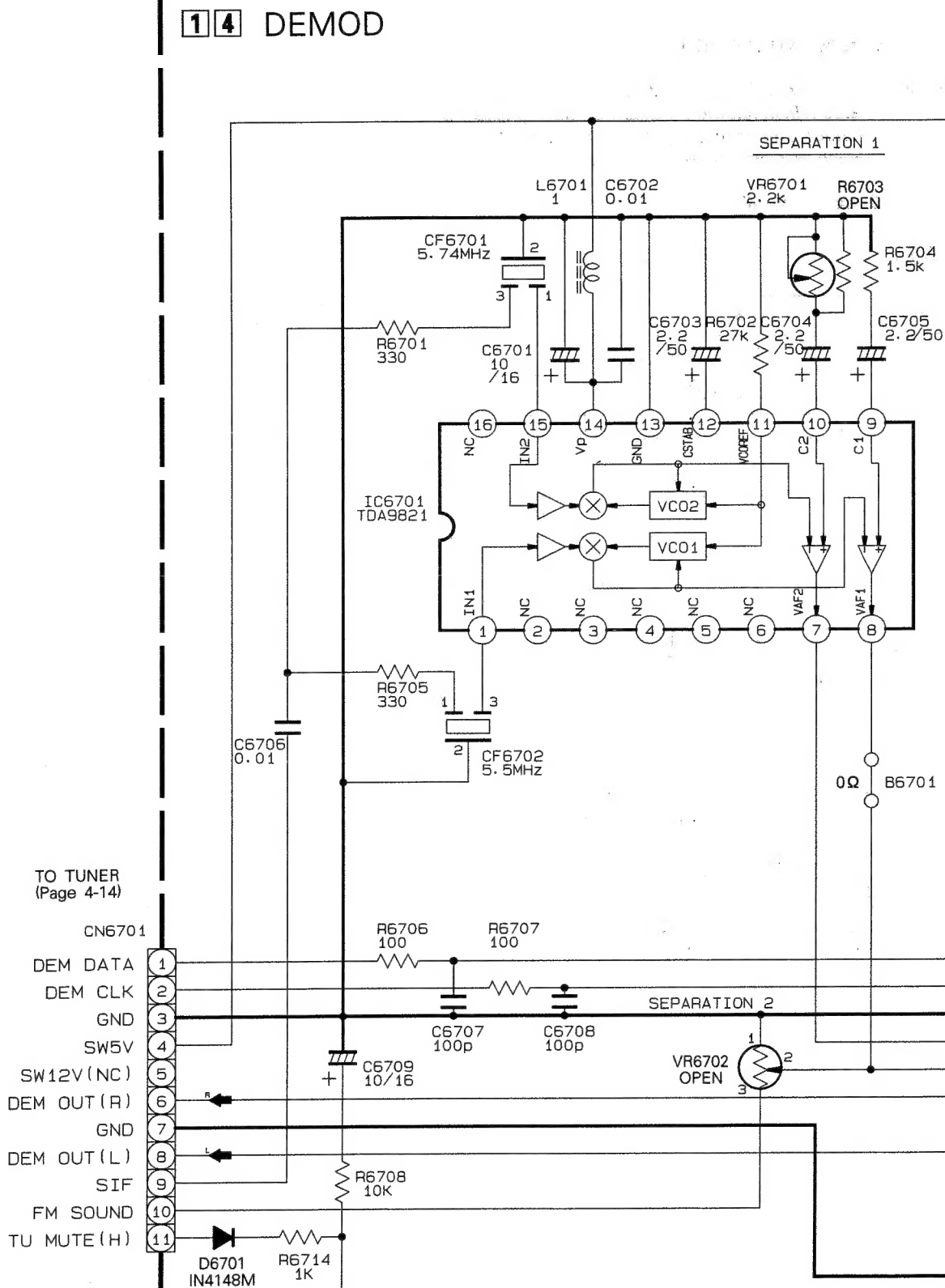


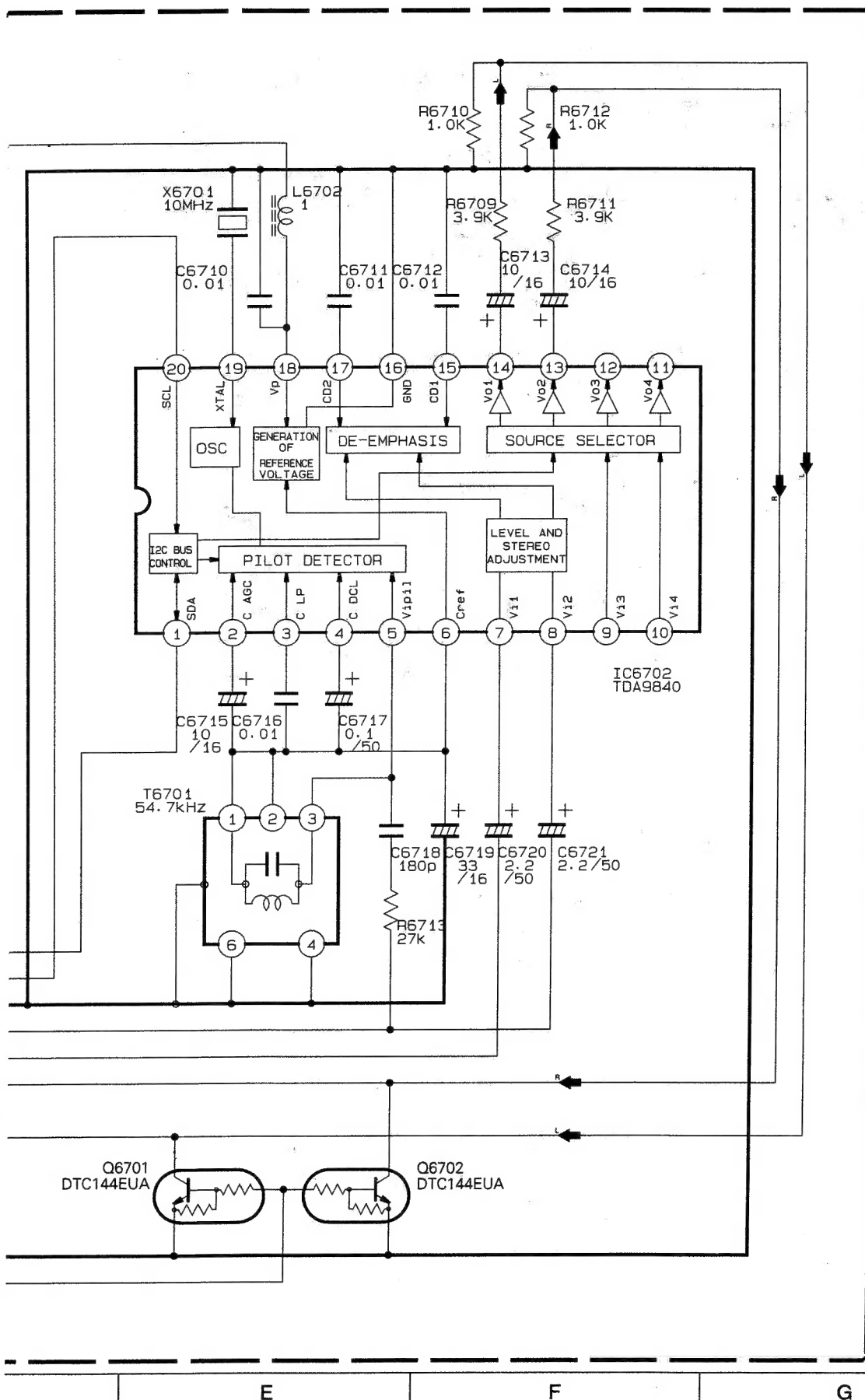
Fig. 3-6-1 Sweeper probe

- (1) Use a sweeper probe as shown in Fig. 3-6-1.
- (2) Supply 1 kHz R-only modulated IF signal to IF terminal of U/V tuner (front end).
- (3) Connect an oscilloscope to CN6701-pin 8.
- (4) Adjust VR6701 for minimum output level.

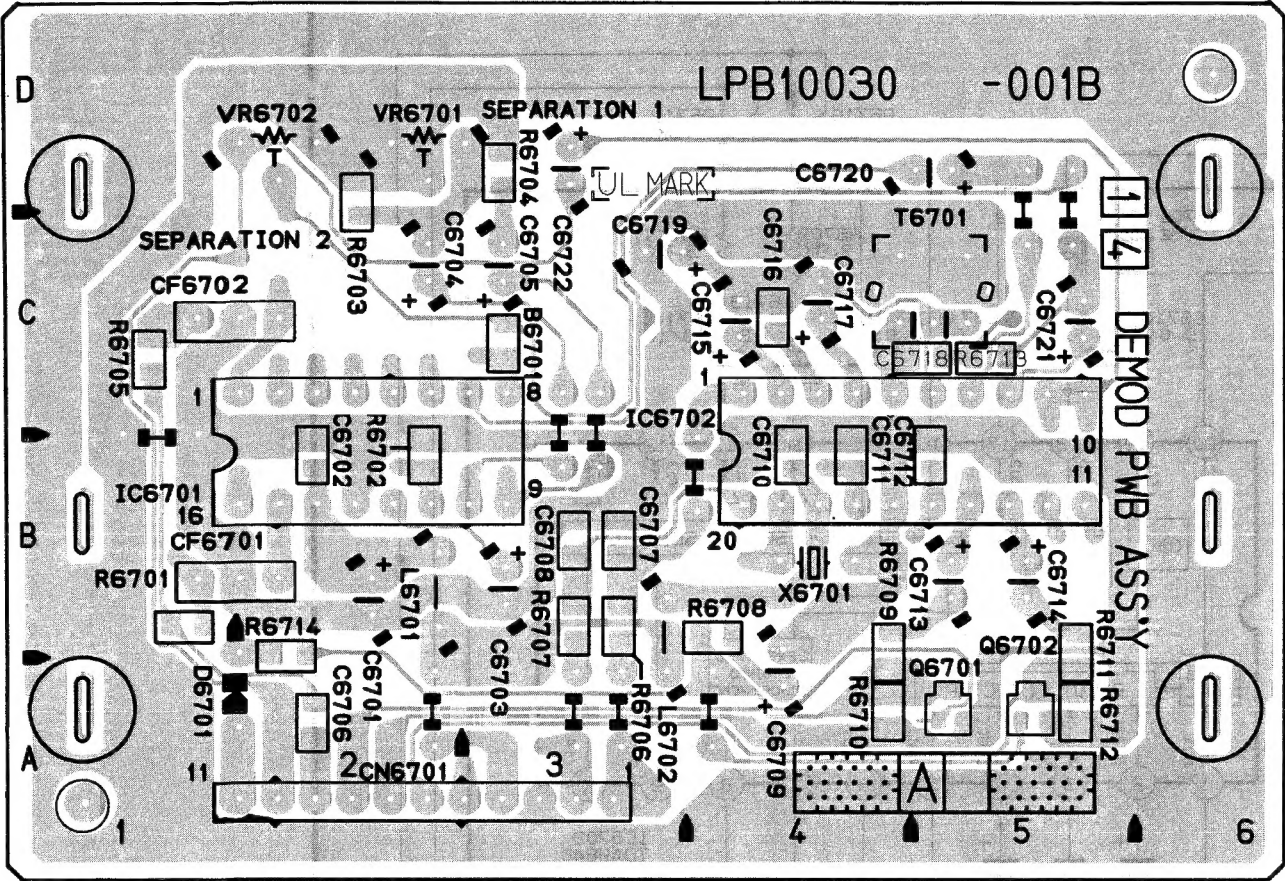
SECTION 4 CHARTS AND DIAGRAMS

4.19 DEMODULATOR SCHEMATIC DIAGRAM





4.20 DEMODULATOR CIRCUIT BOARD



COMPONENT PARTS LOCATION GUIDE < DEMODULATOR >

REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
CAPACITOR		C6717	A D 4C	COIL		R6707	B C 3B
C6702	B C 2B	C6718	B C 5C	L6701	A D 2B	R6708	B C 4B
C6703	A D 3B	C6719	A D 4C	L6702	A D 3B	R6709	B C 4B
C6704	A D 2C	C6720	A D 5D	TRANSISTOR		R6710	B C 4A
C6705	A D 3C	C6721	A D 5C	Q6701	B C 5A	R6711	B C 5B
C6706	B C 2A	C6722	A D 3D	Q6702	B C 5A	R6712	B C 5A
C6707	B C 3B	CONNECTOR		RESISTOR		R6713	B C 5C
C6708	B C 3B	CN6701	A D 3A	R6701	B C 1B	R6714	B C 2B
C6709	A D 4A	DIODE		R6702	B C 2B	OTHER	
C6710	B C 4B	D6701	A D 2A	R6703	B C 2D	CF6701	A D 2B
C6711	B C 4B	IC		R6704	B C 3D	CF6702	A D 1C
C6712	B C 5B	IC6701	A D 2C	R6705	B C 1C	T6701	A D 5C
C6713	A D 5B	IC6702	A D 4C	R6706	B C 3B	VR6701	A D 2D
C6714	A D 5B					VR6702	A D 2D
C6715	A D 4C					X6701	A D 4B
C6716	B C 4C						

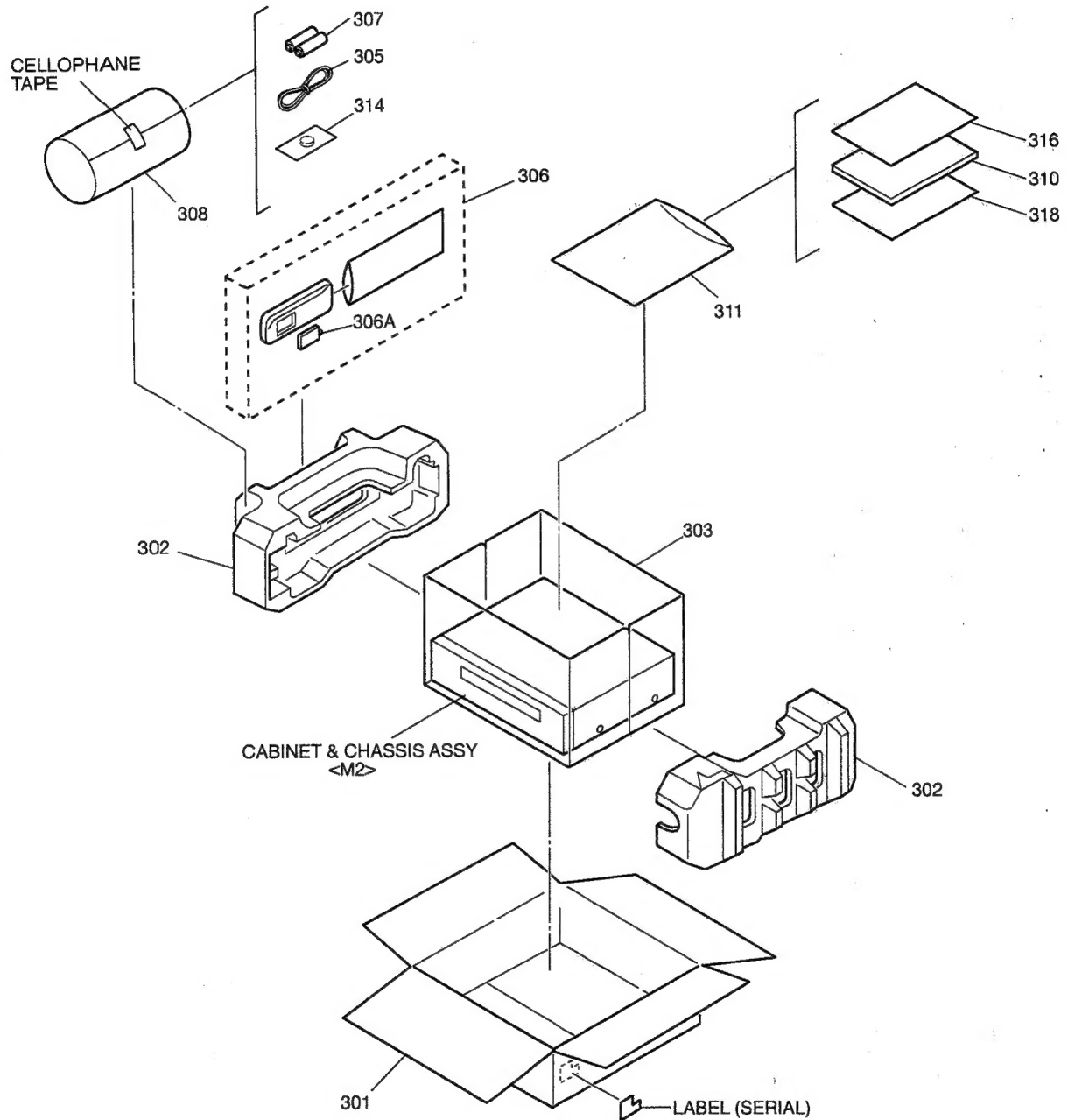
SECTION 5 PARTS LIST

SAFETY PRECAUTION

Parts identified by the \triangle symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.



\triangle REF No. PART No. PART NAME, DESCRIPTION

PACKING AND ACCESSORY ASSEMBLY <M1>

301	LP30423-025B	PACKING CASE
302	LP30424-001D	CUSHION ASSY
303	PQM30021-93	POLY BAG
305	PU59168-7	RF CABLE
306	LP20337-008A	REMOTE CONTROLLER

\triangle REF No. PART No. PART NAME, DESCRIPTION

	306A	LP40254-002B	COVER(BATTERY)
	307	-	BATTERY,X2(R6P TYPE)
	308	QPC02202215P	POLY BAG
\triangle	310	LPT0106-001A	INST.BOOK(EN.CH)
	311	QPC02503515P	POLY BAG
\triangle	314	PECA0903	LI BATTERY
	316	BT-56001-1	WARRANTY CARD
	318	BT-56002-1	SER.NET CARD

5.4 ELECTRICAL PARTS LIST

Δ REF No. PART No. PART NAME, DESCRIPTION

DEMOM BOARD ASSEMBLY <14>

PW1	LPA10030-01B	DEMOM BOARD ASSY	
IC6701	TDA9821/V1	IC	
IC6702	TDA9840	IC	
Q6701	DTC144EU	TRANSISTOR	
Q6702	DTC144EU	TRANSISTOR	
D6701	1N4148M	DIODE	
	or 1SS133	DIODE	
R6701	NRSA02J-331X	MG RESISTOR	330Ω, 1/10W
R6702	NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
R6704	NRSA02J-152X	MG RESISTOR	1.5kΩ, 1/10W
R6705	NRSA02J-331X	MG RESISTOR	330Ω, 1/10W
R6706	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W
R6707	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W
R6708	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R6709	NRSA02J-392X	MG RESISTOR	3.9kΩ, 1/10W
R6710	NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R6711	NRSA02J-392X	MG RESISTOR	3.9kΩ, 1/10W
R6712	NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R6713	NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
R6714	NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
VR6701	QVZ3521-222Z	V RESISTOR, SEPARATION1	
C6701	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C6702	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C6703	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V
C6704	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V
C6705	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V
C6706	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C6707	NDC21HJ-101X	CAPACITOR	100pF, 50V
C6708	NDC21HJ-101X	CAPACITOR	100pF, 50V
C6709	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C6710	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C6711	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C6712	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C6713	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C6714	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C6715	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C6716	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C6717	QEKJ1HM-104	E CAPACITOR	0.1μF, 50V
C6718	NDC21HJ-181X	CAPACITOR	180pF, 50V
C6719	QEKJ1CM-336	E CAPACITOR	33μF, 16V
C6720	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V
C6721	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V
L6701	QQL29BK-1R0Z	COIL	1μH
L6702	QQL29BK-1R0Z	COIL	1μH
CF6701	PU52775-2	CERAMIC FILTER	
CF6702	PU49295-2	N FILTER	
X6701	PEVB0479	CRYSTAL RESONATOR	
T6701	QQR0583-001	LC FILTER	
SD1	LP30478-001A	SHIELD CASE(DEMOD)	
CN6701	QGG2502K1-11	HEADER PIN, (1-11) MAIN	

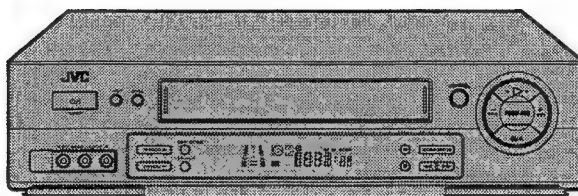
Δ REF No. PART No. PART NAME, DESCRIPTION

JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J657MS



Hi-Fi



SPECIFICATIONS

GENERAL

Power requirement	
Rating	: AC 110 – 240 V~, 50/60 Hz
Operating	: AC 90 – 260 V~, 50/60 Hz
Power consumption	: 22 W
Temperature	
Operating	: 5°C to 40°C
Storage	: -20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 340 mm
Weight	: 3.8 kg
Format	: VHS standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette (PAL/MESECAM) : 160 min. with T-160 video cassette (NTSC)
(LP)	: 480 min. with E-240 video cassette (PAL/MESECAM)
(EP)	: 480 min. with T-160 video cassette (NTSC)

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields : NTSC colour and EIA monochrome signals, 525 lines/60 fields
Recording system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB

Horizontal resolution	: 250 lines (PAL/MESECAM) : 220 lines (NTSC)
Frequency range	: 70 Hz to 10,000 Hz (Normal audio) : 20 Hz to 20,000 Hz (Hi-Fi audio)
Input/Output	: RCA connectors (IN x 2, OUT x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF (Low) 42 – 175 MHz (High) 175 – 470 MHz UHF 470 – 870 MHz
Aerial output	: UHF channels (Adjustable E28 – E60)
Memory backup time	: Approx. 6 months Estimated figure based on supplied fresh battery; actual performance may differ.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6/UM-3" battery x 2, Lithium battery CR2025, Conversion plug*
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*Not provided in certain areas.

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.



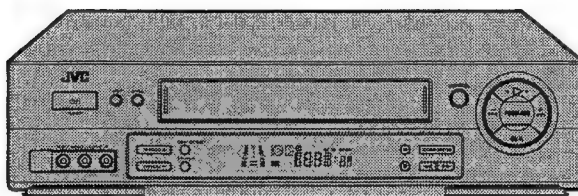
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JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J657MS

**Hi-Fi**

SPECIFICATIONS

GENERAL

Power requirement	
Rating	: AC 110 – 240 V~, 50/60 Hz
Operating	: AC 90 – 260 V~, 50/60 Hz
Power consumption	: 22 W
Temperature	
Operating	: 5°C to 40°C
Storage	: -20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 340 mm
Weight	: 3.8 kg
Format	: VHS standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette (PAL/MESECAM)
	: 160 min. with T-160 video cassette (NTSC)
(LP)	: 480 min. with E-240 video cassette (PAL/MESECAM)
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VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
	: NTSC colour and EIA monochrome signals, 525 lines/60 fields
Recording system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB

Horizontal resolution	: 250 lines (PAL/MESECAM)
	: 220 lines (NTSC)
Frequency range	: 70 Hz to 10,000 Hz (Normal audio)
	: 20 Hz to 20,000 Hz (Hi-Fi audio)
Input/Output	: RCA connectors (IN x 2, OUT x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF (Low) 42 – 175 MHz
	: (High) 175 – 470 MHz
	: UHF 470 – 870 MHz
Aerial output	: UHF channels (Adjustable E28 – E60)
Memory backup time	: Approx. 6 months
	: Estimated figure based on supplied fresh battery; actual performance may differ.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6/UM-3" battery x 2, Lithium battery CR2025, Conversion plug*
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*Not provided in certain areas.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

●Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the \triangle symbol and shaded (■) parts are critical for safety.
Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

5. Use specified insulating materials for hazardous live parts.
Note especially:
1) Insulation Tape 3) Spacers 5) Barrier
2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

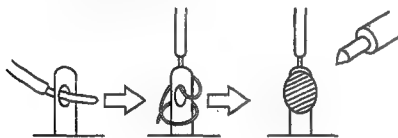


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

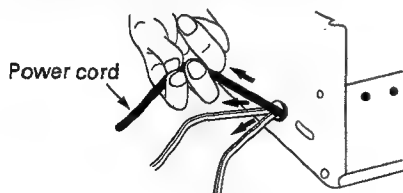


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) **Connector part number :** E03830-001

2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.

3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).



Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

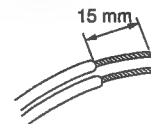


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

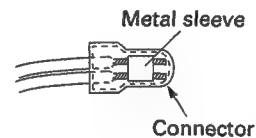


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

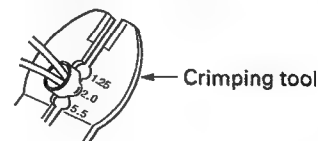


Fig.6

(5) Check the four points noted in Fig.7.

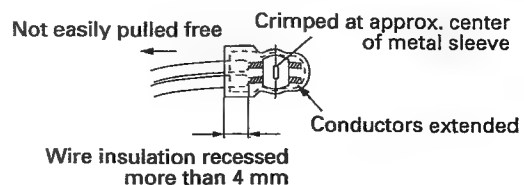


Fig.7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

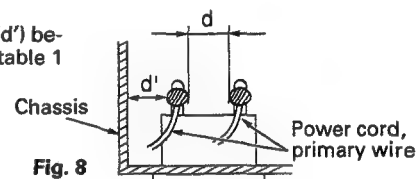


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

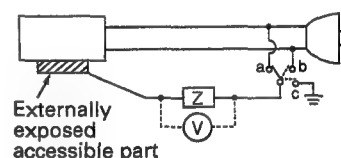


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

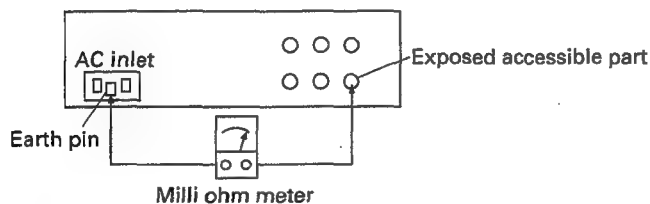


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega/500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 1 kV 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega/500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Power cord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ in parallel with $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
220 to 240 V		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

Safety Precautions

The rating plate and the safety caution are on the rear of the unit.

WARNING: DANGEROUS VOLTAGE INSIDE

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the mains outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the mains outlet prior to connecting or disconnecting any signal lead or aerial.
- Use the conversion plug (not provided in certain areas) depending on the type of your AC wall outlet.

ATTENTION

1. This recorder can also receive SECAM colour television signals for recording and playback.
2. Recordings made of SECAM television signals produce monochrome pictures if played back on another video recorder of SECAM standard, or do not produce normal colour pictures if played back on another video recorder of PAL standard.
3. SECAM prerecorded cassettes or recordings made with a SECAM video recorder produce monochrome pictures when played back with this recorder.

POWER SYSTEM

This set operates on voltage of AC110 ~ 240 V~ (Rating), AC90 ~ 260 V~ (Operating), 50/60 Hz with automatic switching.

Warning on lithium battery

The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, heat above 100°C or incinerate. Replace battery with Panasonic (Matsushita Electric), Sanyo, Sony or Maxell CR2025; use of another battery may present a risk of fire or explosion.

- Dispose of used battery promptly.
- Keep away from children.
- Do not disassemble and do not dispose of in fire.

IMPORTANT

- Please read the various precautions on this page before installing or operating the recorder.
- It should be noted that it may be unlawful to re-record pre-recorded tapes, records, or discs without the consent of the owner of copyright in the sound or video recording, broadcast or cable programme and in any literary, dramatic, musical, or artistic work embodied therein.

The POWER ϕ /I button does not completely shut off mains power from the unit, but switches operating current on and off. " ϕ " shows electrical power standby and " I " shows ON.

Video tapes recorded with this video recorder in the LP (Long Play) or EP (Extended Play) mode cannot be played back on a single-speed video recorder.

Failure to heed the following precautions may result in damage to the recorder, remote control or video cassette.

1. **DO NOT** place the recorder . . .
... in an environment prone to extreme temperatures or humidity.
... in direct sunlight.
... in a dusty environment.
... in an environment where strong magnetic fields are generated.
... on a surface that is unstable or subject to vibration.
2. **DO NOT** block the recorder's ventilation openings.
3. **DO NOT** place heavy objects on the recorder or remote control.
4. **DO NOT** place anything which might spill on top of the recorder or remote control.
5. **Avoid** violent shocks to the recorder during transport.

MOISTURE CONDENSATION

Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form in the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder turned on for a few hours to let the moisture dry.

ABOUT HEAD CLEANING

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

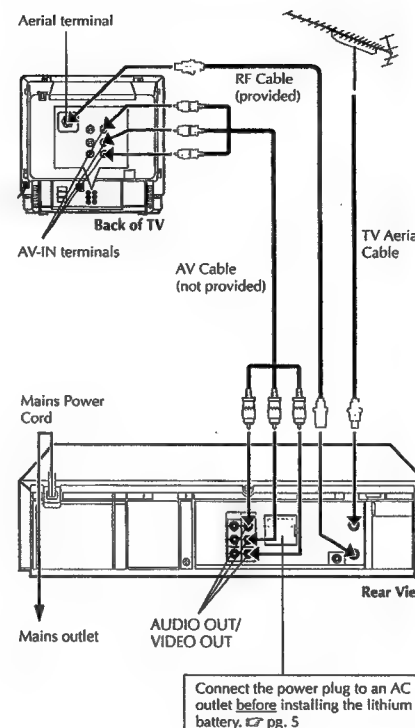
Auto Head Cleaner

A built-in head cleaner automatically cleans the video heads and head drum whenever a tape is loaded or unloaded to reduce head clogging.



- Only cassettes marked "VHS" can be used with this videorecorder.
- HQ VHS is compatible with existing VHS equipment.

Basic Connections



It's essential that your video recorder be properly connected. Follow these steps carefully. THESE STEPS MUST BE COMPLETED BEFORE ANY VIDEO OPERATION CAN BE PERFORMED.

CHECK CONTENTS

Make sure the package contains all of the accessories listed in "Specifications" (pg. 41).

SITUATE RECORDER

Place the recorder on a stable, horizontal surface.

CONNECT RECORDER TO TV

The connection method you use depends on the type of TV you have.

RF CONNECTION

- To Connect To A TV With NO AV Input Terminals . . .
a— Disconnect the TV aerial cable from the TV.
b— Connect the TV aerial cable to the ANT. IN jack on the rear panel of the recorder.
c— Connect the provided RF cable between the RF OUT jack on the rear panel of the recorder and the TV's aerial terminal.

AV CONNECTION

- To Connect To A TV With AV Input Terminals . . .
a— Connect the aerial, recorder and TV as per "RF CONNECTION".
b— Connect an optional AV cable between the AUDIO OUT and VIDEO OUT connectors on the rear panel of the recorder and the TV's AV-IN terminals.

CONNECT RECORDER TO MAINS

Plug the end of the mains power cord into a mains outlet.

NOTE:

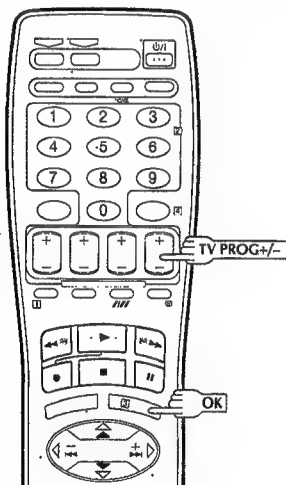
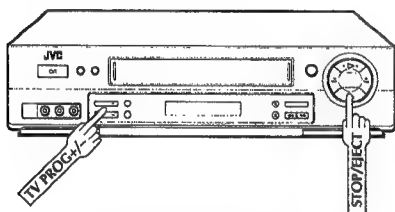
Use the conversion plug (not provided in certain areas) depending on the type of your AC wall outlet.

ATTENTION

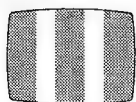
If you have finished all the necessary connections, go to "Video Channel Set" on page 4, then perform Auto Set Up on page 6; do NOT press the ϕ /I button on the recorder/remote control to turn on the recorder's power before you start Auto Set Up.

Video Channel Set

Video Channel (RF Output Channel) is the channel on which your TV receives picture and sound signals from the video recorder through the RF cable.



TEST SIGNAL



The channel on which the screen to the left appear clearly in step 3 is your Video Channel.

To view picture signals from the video recorder, set your TV to the Video Channel.

If you have connected the video recorder to your TV via the provided RF cable only (RF connection) – Go to "With RF Connection" below.

If you have connected the video recorder to your TV via both the provided RF cable and an AV cable (AV connection) – Go to "With AV Connection" on next page.

With RF Connection

IMPORTANT:

Before performing the following steps, make sure the recorder's power is off and there is no cassette inserted in the recorder.

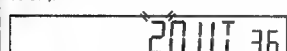
ACCESS VIDEO CHANNEL SET MODE

1 Hold down STOP/EJECT on the recorder until the display panel shows the following.



SELECT TV SYSTEM

2 Press TV PROG + or – to set appropriate TV system that matches the system of TV being used (refer to the table below).



1: B/G 2: D/K 3: I 4: M

Major Countries	TV System
Kuwait, U.A.E., Indonesia, Singapore, Thailand, Malaysia, Iran, Saudi Arabia, Egypt, Morocco, Lebanon, Iraq	B/G
China, Mongolia, Russia	D/K
Hong Kong	I
U.S.A., Japan, S.Korea, Taiwan	M

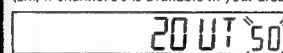
3

SET VIDEO CHANNEL

Set your TV to UHF channel 36.

- If the two vertical white bars appear clearly on the screen as shown in the illustration (TEST SIGNAL on page 4), press OK and then go to step 4.
- If the two vertical white bars do not appear clearly, press OK and then TV PROG + or – to set the video recorder to a vacant channel between 28 and 60 which is not occupied by any local station in your area.

(Ex.) If channel 50 is available in your area



Then set your TV to UHF channel 50 and check if the two vertical white bars appear clearly on the screen; if so, go to step 4. If not, re-set the video recorder to another vacant channel and try again.

NOTES:

- If you set the video recorder to a channel which is occupied by a local station or has neighbouring channels that are occupied by local stations, the picture reception quality will be affected and some interference noise will appear on the TV screen. Be sure to select a vacant channel which has no broadcast on neighbouring channels.
- If you cannot obtain the two vertical white bars clearly with any channel between 28 and 60, consult your JVC dealer.

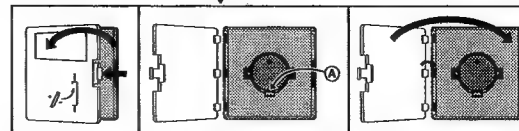
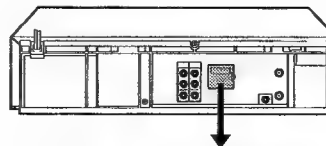
FINISH VIDEO CHANNEL SET

Press OK.

4

- If Auto Set Up (pg. 6) or Tuner Set (pg. 30) has not previously been performed, the Language Select screen appears and Auto Set Up function takes place automatically.

Be sure to connect the power plug to an AC outlet first before installing the lithium battery; otherwise, the battery's service life will be drastically shortened.



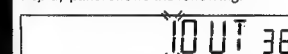
With AV Connection

IMPORTANT:

Before performing the following steps, make sure the recorder's power is off and there is no cassette inserted in the recorder.

ACCESS VIDEO CHANNEL SET MODE

1 Hold down STOP/EJECT on the recorder until the display panel shows the following.



SET VIDEO CHANNEL

2 Press OK, then press TV PROG – until the display panel shows the following.



Now the video channel is set to off (–).

FINISH VIDEO CHANNEL SET

Press OK.

- If Auto Set Up (pg. 6) or Tuner Set (pg. 30) has not previously been performed, the Language Select screen appears and Auto Set Up function takes place automatically.

To view picture signals from the video recorder, set your TV to its AV mode.

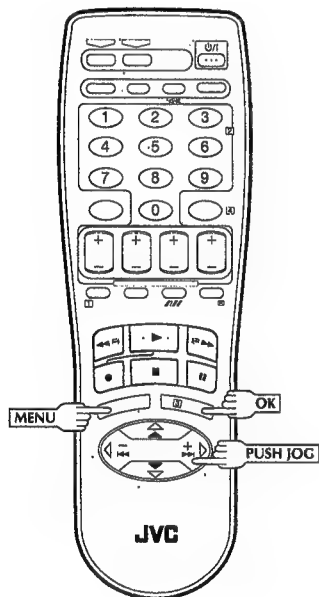
Installing/Removing the lithium battery

- 1 Make sure that the power plug is connected to an AC outlet and turn off the VCR power.
- 2 Open the battery cover while pressing the release tab as illustrated.
- 3 Insert a lithium battery with the plus (+) side up and push it in.
 - To remove the lithium battery, press the latch (A) downward using a pointed non-metallic object, then pull out the lithium battery.
- 4 Close the battery cover until it clicks in place.

Auto Set Up

IMPORTANT

- Don't press any buttons on the recorder or remote that are not directly related to the step you are performing while Auto Set Up is in progress.
- If you perform Auto Set Up successfully during installation, there's no need to separately perform the Language Select, Clock Set or Channel Set procedures, but if adjustments become necessary they can be performed as follows:
 - To change the selected language pg. 9
 - To reset or adjust the time pg. 9
 - To add/delete channels manually pg. 31
 - To reset the tuner after moving to a different location pg. 30



The Auto Set Up function simplifies installation by guiding you through the procedures of setting the language, clock and tuner channels — simply follow the on-screen menus that appear.

Before starting, make sure of the following:

- The TV aerial cable should be connected to the recorder.
- The recorder's mains power cord should be connected to a mains outlet. pg. 3
- The "Video Channel Set" procedure should be done first and the TV should be set to its AV mode (with AV connection pg. 5) or video channel (with RF connection pg. 4).

SELECT LANGUAGE

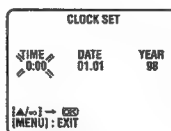
- 1 Press **PUSH JOG** to place the pointer next to your desired language (English or Chinese), then press **OK** or **PUSH JOG** .

- The Clock Set screen appears.

SET TIME

- 2 Press **PUSH JOG** to set the time, then press **OK** or **PUSH JOG** .

- Press and hold either button to delay or advance the time by 30 minutes.



SET DATE

- 3 Press **PUSH JOG** to set the date, then press **OK** or **PUSH JOG** .

- Press and hold either button to change the date by 15 days.

SET YEAR

- 4 Press **PUSH JOG** to set the year, then press **MENU**.

SELECT TV SYSTEM

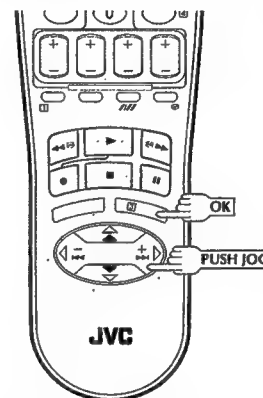
Press **PUSH JOG** to place the pointer next to the appropriate TV system (refer to the table on the left).

START AUTO CHANNEL SET

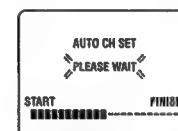
Press **OK** or **PUSH JOG** .

- The Auto Set Up function scans all the channels that are receivable by your recorder. It then automatically assigns each receivable channels to the **TV PROG** buttons. It skips non-receivable channels.
- As Auto Set Up progresses, the "■" mark on the screen moves from left to right. (See below.)

Major Countries	TV System
Kuwait, U.A.E., Indonesia, Singapore, Thailand, Malaysia, Iran, Saudi Arabia, Egypt, Morocco, Lebanon, Iraq	B/G
China, Mongolia, Russia	D/K
Hong Kong	I
U.S.A., Japan, S.Korea, Taiwan	M



DO NOT press any button on the recorder or remote control while Auto Set Up is in progress.



During Auto Set Up "PLEASE WAIT" blinks on the screen and "Auto" blinks on the front display panel.



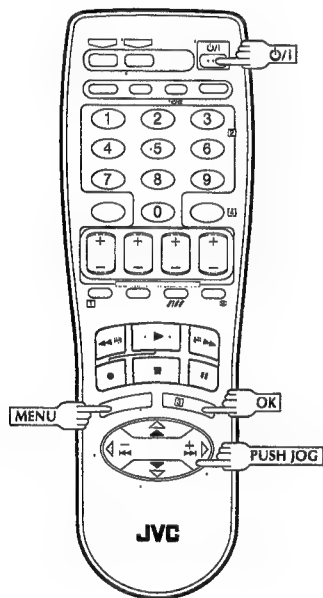
When Auto Set Up is completed, the lowest position number will appear on the front display panel.

NOTES:

- If you perform Auto Set Up when the aerial cable is not connected properly, "SCAN COMPLETED -NO SIGNAL-" appears on the screen. When this happens, make sure of the aerial connection and press **OK**; Auto Set Up will take place again.
- If there is a power cut, or if you press **CH** or **MENU** while Auto Set Up is in progress, Auto Set Up will be interrupted; be sure to turn off the recorder power once and try again.
- If you want to set the tuner manually such as to add or skip channels, to swap channel positions, or to fine-tune channels, pg. 31-33.
- If no sound accompanies the picture on some channels that have been stored by Auto Set Up, the TV system setting for those channels may be incorrect. Select the appropriate TV system for those channels. "TV System Selection - When you see the picture but hear no audio" on page 33.

On-Screen Displays

Turn on the TV and select the VIDEO channel (or AV mode).



You can choose whether or not to have various operational indicators appear on screen, by setting this function ON or OFF.

1 TURN ON THE RECORDER

Press ϕ/I .

2 ACCESS MAIN MENU SCREEN

Press MENU.

3 ACCESS FUNCTION SET SCREEN

Place the pointer next to "FUNCTION SET" by pressing PUSH JOG $\Delta \nabla$, then press OK or PUSH JOG \triangleright .

4 ENABLE/DISABLE ON-SCREEN DISPLAY

The default setting is "ON", so if you want on-screen displays, leave the setting as it is and go to step 5. If you don't want the displays to appear, press PUSH JOG $\Delta \nabla$ to place the pointer next to "O.S.D." and press OK or PUSH JOG \triangleright to set to "OFF".

FUNCTION SET	
AUTO TIMER	OFF
O.S.D.	ON
S.E.S.T.	ON
AUTO SP \rightarrow LP TIMER	OFF
[A/-] \rightarrow OSD [MENU] : EXIT	

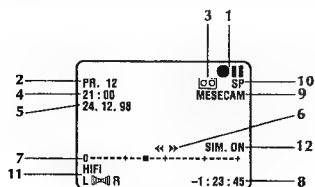
5 RETURN TO NORMAL

Press MENU.

NOTES:

- When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF" before starting.
- During playback, the operation mode indicators may be disturbed depending on the type of tape being used.

The superimposed indication on the TV screen tells you what the recorder is doing.



- 1- Operation mode indicators
- 2- Channel position number/Aux. indicator (L-1 or F-1)
- 3- Cassette loaded mark
- 4- Clock display
- 5- Current day/month/year
- 6- Tape direction
- 7- Tape position indicator (pg. 13)
- 8- Counter display
- 9- Colour system indicator (pg. 28)
- 10- Tape speed SP/LP/EP
- 11- Audio mode display (pg. 14)
- 12- Simulcast recording indicator (pg. 17)

Select Language

Turn on the TV and select the VIDEO channel (or AV mode).

1 TURN ON THE RECORDER

Press ϕ/I .

2 ACCESS MAIN MENU SCREEN

Press MENU.

3 ACCESS INITIAL SET SCREEN

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "INITIAL SET", then press OK or PUSH JOG \triangleright .

MAIN MENU	
FUNCTION SET	TUNER SET
[I] INITIAL SET	
[A/-] \rightarrow OSD [MENU] : EXIT	

4 ACCESS LANGUAGE SELECT SCREEN

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "LANGUAGE", then press OK or PUSH JOG \triangleright .

5 SELECT LANGUAGE

Place the pointer next to the language of your choice (English or Chinese) by pressing PUSH JOG $\Delta \nabla$, then press OK or PUSH JOG \triangleright .

6 RETURN TO NORMAL SCREEN

Press MENU.

Clock Set

Turn on the TV and select the VIDEO channel (or AV mode).

1 TURN THE RECORDER ON

Press ϕ/I .

2 ACCESS MAIN MENU SCREEN

Press MENU.

3 ACCESS INITIAL SET SCREEN

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "INITIAL SET", then press OK or PUSH JOG \triangleright .

4 ACCESS CLOCK SET SCREEN

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "CLOCK SET", then press OK or PUSH JOG \triangleright . The Clock Set screen appears.

INITIAL SET		CLOCK SET	
[I] CLOCK SET	LANGUAGE	TIME	DATE
[A/-] \rightarrow OSD [MENU] : EXIT		0:00	01.01
			YEAR
			00
		[A/-] \rightarrow OSD [MENU] : EXIT	

5 SET TIME

Press PUSH JOG $\Delta \nabla$ to set the time, then press OK or PUSH JOG \triangleright .

- Press and hold either button to delay or advance the time by 30 minutes.

6 SET DATE

Press PUSH JOG $\Delta \nabla$ to set the date, then press OK or PUSH JOG \triangleright .

- Press and hold either button to change the date by 15 days.

7 SET YEAR

Press PUSH JOG $\Delta \nabla$ to set the year.

8 START CLOCK OPERATION

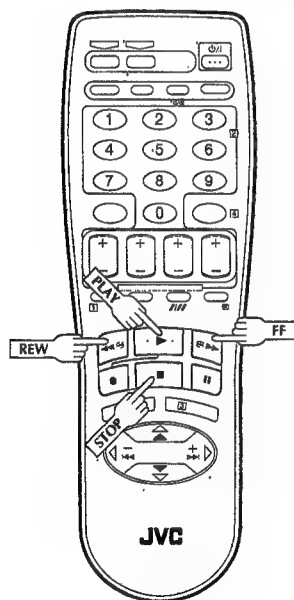
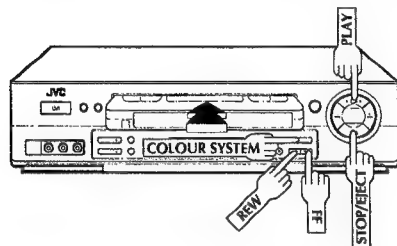
Press MENU.

NOTE:

If the year digits are automatically cleared, it is possible that you have input 29th February for a non-leap year. Input the correct data.

Basic Playback

Turn on the TV and select the VIDEO channel (or AV mode).



The easiest, most basic operation possible with your video recorder is tape playback. Already-recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.

1 LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is point toward the recorder. Don't apply too much pressure when inserting.

- The recorder power comes on automatically and the counter is reset to 0:00:00.
- Select the appropriate colour system by pressing the COLOUR SYSTEM button. (pg. 28)
- If the record safety tab has been removed, playback begins automatically. (pg. 15)

2 FIND PROGRAMME START POINT

If the tape is advanced past the start point, press REW. To go forward, press FF.

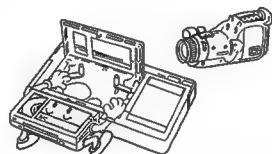
3 START PLAYBACK

Press PLAY. "BEST" appears blinking in the recorder's display panel during automatic tracking. (pg. 18)

4 STOP PLAYBACK

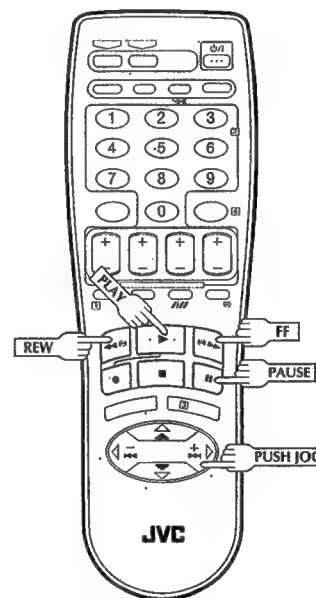
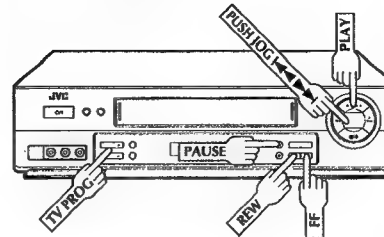
Press STOP on the remote or STOP/EJECT on the recorder's front panel. Then press STOP/EJECT to remove the cassette.

Usable cassettes



- Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.
- This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS signals only. It is not possible to play back a recorded Super VHS tape.

Playback Features



Variable-Speed Search

1 ACTIVATE VARIABLE-SPEED SEARCH

During playback, press PUSH JOG ◀ or ▶.

- The more times you press, the faster the playback picture moves.
- To decrease speed, press the button for the opposite direction.

To resume normal playback, press PLAY.

Still Picture/Frame-By-Frame Playback

1 PAUSE DURING PLAYBACK

Press PAUSE. If there is vertical jitter, use the TV PROC buttons to correct the picture.

2 ACTIVATE FRAME-BY-FRAME PLAYBACK

Press PAUSE.

OR

Press PUSH JOG ◀ or ▶.

To resume normal playback, press PLAY.

Slow Motion

1 ACTIVATE SLOW-MOTION PLAYBACK

During still picture, press and hold PAUSE for 2 seconds, then release. Press and release again to return to still picture.

OR

During still picture, press and hold PUSH JOG ◀ or ▶. Release to return to still picture.

To resume normal playback, press PLAY.

High-Speed Search

1 ACTIVATE HIGH-SPEED SEARCH

During playback or still, press FF for forward high-speed search, or REW for reverse high-speed search.

To resume normal playback, press PLAY.

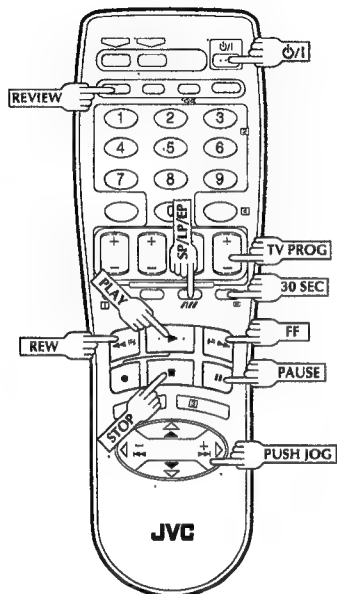
NOTE:

For short searches, press and hold FF or REW for over 2 seconds during playback or still picture. When released, normal playback resumes.

ATTENTION

In the search, still, slow-motion or frame-by-frame playback mode,

- the picture will be distorted.
- the noise bars will appear.
- there will be a loss of colour with an LP-recorded tape.



Manual Tracking

Your video recorder is equipped with automatic tracking control. During playback, you can override this and adjust the tracking manually by pressing the TV PROG buttons.



1 OVERRIDE AUTOMATIC TRACKING

Press **///** (SP/LP/EP) on the remote to engage manual tracking.

2 ADJUST TRACKING MANUALLY

Press TV PROG + or - to adjust tracking.

3 RETURN TO AUTOMATIC TRACKING

Press **///** (SP/LP/EP) on the remote to re-engage automatic tracking.

NOTE:

When a new tape is inserted, the recorder enters the automatic tracking mode automatically.

Repeat Playback

Your video recorder can automatically play back the whole tape 50 times repeatedly.



1 START PLAYBACK

Press PLAY.

2 ACTIVATE REPEAT PLAYBACK

Press PLAY and hold for over 5 seconds, then release.

- The Play indicator (▶) on the display panel blinks slowly.
- The tape plays 50 times automatically, and then stops.

3 STOP PLAYBACK

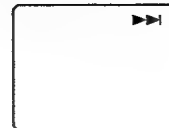
Press STOP at any time to stop playback.

NOTE:

Pressing **PLAY**, **REW**, **FF** or **PAUSE** also stops Repeat Playback.

Index Search

Your recorder automatically marks index codes at the beginning of each recording. This function gives you quick access to any one of 9 index codes in either direction.



NOTE:

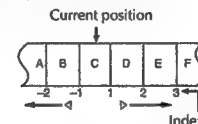
Before starting, make sure the recorder is in the Stop mode.

1 ACTIVATE INDEX SEARCH

Press **PUSH JOG** < or > (◀ or ▶) on the remote control. "◀ 1" or "▶ 1" is displayed on screen and search begins in the corresponding direction.

- To access index codes 2 through 9, press **PUSH JOG** < or > repeatedly until the correct index number is displayed.

Ex.: To locate the beginning of B from the current position, press **PUSH JOG** < twice.
To locate the beginning of D from the current position, press **PUSH JOG** > once.



- When the specified index code is located, playback begins automatically.

Instant ReView

Simply by pressing a single button, the recorder power comes on, rewinds, and begins playback of the last timer-recorded programme. If you have several programmes recorded, you can easily access any of them.

NOTE:

Before starting, make sure that the recorder is off and that the Timer mode is disengaged.

1 ACTIVATE INSTANT REVIEW

Press **REVIEW**. The recorder power comes on and the recorder searches for the index code indicating the start of the last timer-recorded programme. Once it's found, playback begins automatically.

- The front display panel tells you how many programmes have been recorded. If you have, for example, 3 programmes, "REVIEW" and "3" appear and blink. To watch the first of the 3 programmes, press **REVIEW** three times. The recorder searches and begins playback automatically. You can access a programme as far as 9 index codes away from the current tape position.

NOTE:

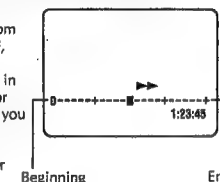
Instant ReView is not possible while the recorder is in the Timer mode.

Next Function Memory

You can set your recorder's power to go off automatically after the tape is fully rewound. Before starting, make sure the recorder is in the Stop mode.
For Automatic Power Off After Tape Rewind... press **REW**, then press **⏻** within 2 seconds.

Tape Position Indicator

The tape position indicator appears on screen when, from the Stop mode, you press **FF**, **REW** or perform an Index Search. The position of "■" in relation to "0" (beginning) or "+" (end) shows you where you are on the tape.
"O.S.D." (pg. 8) must be set to "ON", or the indicator will not appear.



NOTE:

Depending on the type of tape used, there may be times when the indication is not correct.

Skip Search

1 SKIP OVER UNWANTED SECTIONS

Press **30 SEC** 1 to 4 times during playback. Each press initiates a 30-second period of fast-motion playback. Normal playback resumes automatically.

NOTE:

To return to normal playback during a Skip Search, press **PLAY**.

Soundtrack Selection

Your video recorder is capable of recording three soundtracks (Hi-Fi L, Hi-Fi R and NORM) and will play back the one you select.

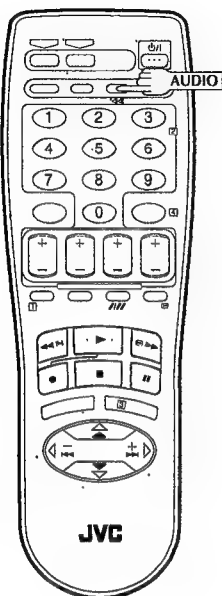
During Playback

Pressing **AUDIO** changes the soundtrack being played back as follows:

TRACK		USE
Recorder's Front Panel	On-Screen Display	
L + R	HI FI L R	For Hi-Fi stereo tapes
L	HI FI L	For main audio of Bilingual tapes
R	HI FI R	For sub audio of Bilingual tapes
NORM	NORM	For audio-dubbed tapes
L + R + NORM	HI FI NORM	For audio-dubbed tapes

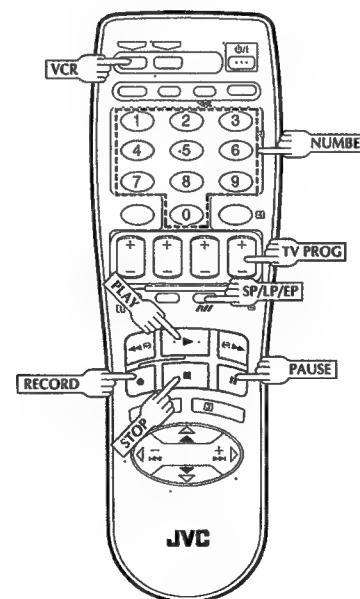
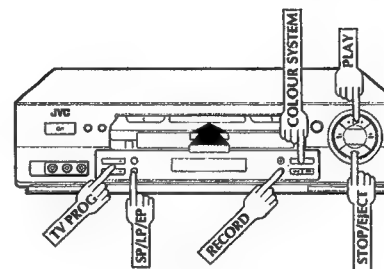
NOTES:

- "L + R" should normally be selected. In this mode, Hi-Fi stereo tapes are played back in stereo, and the NORM track is played back automatically for tapes with only normal audio.
- "O.S.D." must be set to "ON" or the on-screen displays will not appear (pg. 8).



Basic Recording

- Turn on the TV and select the VIDEO channel (or AV mode).
- Press **VCR** on the remote control to select the VCR mode.



TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. You can "capture" a TV programme using your video recorder.

LOAD A CASSETTE

Insert a cassette with the record safety tab intact.

- The counter is reset to 0:00:00 and the recorder power comes on automatically.
- Select the appropriate colour system by pressing the **COLOUR SYSTEM** button (pg. 28).

CHOOSE A PROGRAMME

Press **TV PROG +/-** or the **NUMBER** keys to select the channel you wish to record.

SET TAPE SPEED

Press **SP/LP/EP**. Check the SP/LP/EP indicator on the recorder display panel to confirm the selected tape speed.

START RECORDING

Press and hold **RECORD** and **PLAY** on the remote control, or press **RECORD** on the recorder.

B.E.S.T. takes place at the beginning of each first SP and first LP (or EP) recording after inserting the cassette (pg. 18).

PAUSE/RESUME RECORDING

Press **PAUSE**. Press **PLAY** to resume recording.

STOP RECORDING

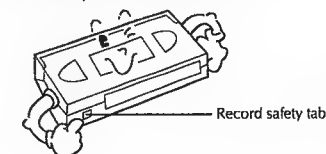
Press **STOP** on the remote control or **STOP/EJECT** on the recorder. Then press **STOP/EJECT** to remove the cassette.

Recording Resume Function

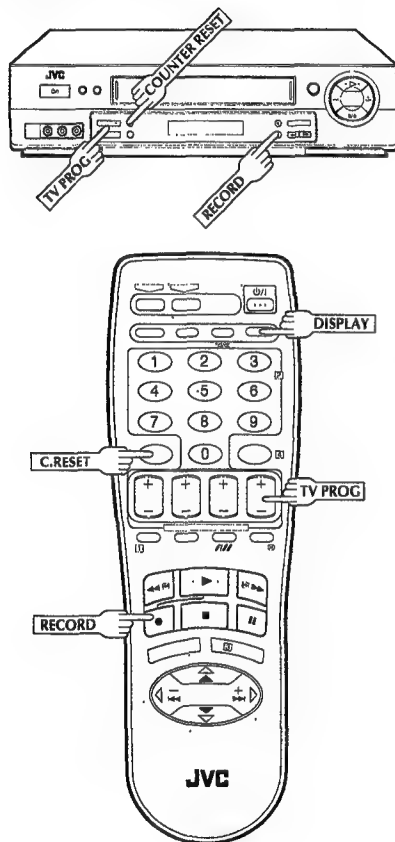
If there is a power outage during recording (or Instant Timer Recording or timer recording), the recording will resume automatically when power is restored to the recorder unless the recorder's memory backup has expired.

Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.



Recording Features



Record One Programme While Watching Another

1 SELECT CHANNEL TO WATCH

Once recording is in progress, all you need to do is to set the channel controls on the TV for the station you wish to view.

- The programme selected with the TV's channel controls appears on the TV screen while the one selected with the TV PROG buttons is recorded on the tape.

Elapsed Recording Time Indication

You can check the exact time of a recording.

1 SET COUNTER DISPLAY

Press **DISPLAY** until a counter reading appears on the display panel.

2 RESET COUNTER

Press **C. RESET** (or **COUNTER RESET**) before starting recording or playback.

- The counter is reset to "0:00:00" and shows the exact elapsed time as the tape runs.

Instant Timer Recording (ITR)

This easy method lets you record for from 30 minutes to 6 hours (selectable in 30-min. increments), and shuts the recorder off after recording is finished.

1 START RECORDING

Press **RECORD** on the recorder.

2 ENGAGE ITR MODE

Press **RECORD** again. "ITR" blinks and 0:30 appears on the front display panel.

3 SET RECORDING DURATION

If you want to record for more than 30 minutes, press **RECORD** to extend the time. Each press extends recording time by 30 minutes.

NOTE:

You can only perform ITR using the **RECORD** button on the recorder's front panel.

Simulcast Recording

If FM simulcast TV programmes are available, you can record the TV programme with the soundtrack from an FM-broadcast. In the simulcast mode, the external audio programme is recorded on the audio track (both Hi-Fi and normal).

1 MAKE CONNECTIONS

Connect the FM tuner to the rear panel **AUDIO IN** connectors.

2 CHOOSE FM BROADCAST

Set the FM tuner to the desired broadcast.

3 SELECT TV PROGRAMME

Press **TV PROG** or the **NUMBER** keys to select the TV programme you wish to record.

4 ENGAGE SIMULCAST MODE

Press **SIMUL**.

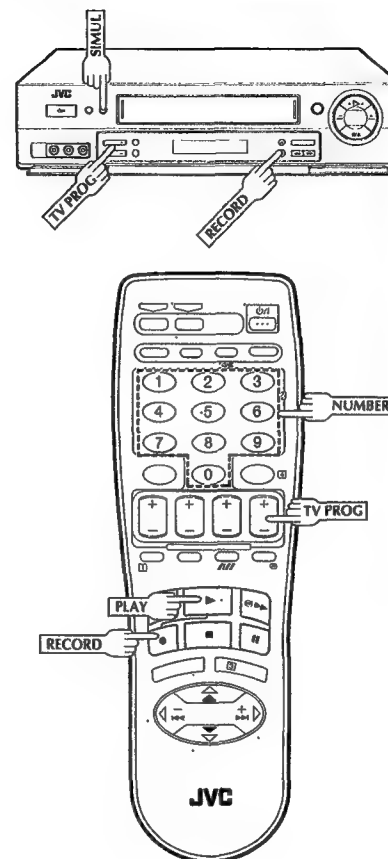
- "SIM. ON" will appear on the screen.

5 START RECORDING

Press **RECORD** on the recorder (or **RECORD** and **PLAY** on the remote control).

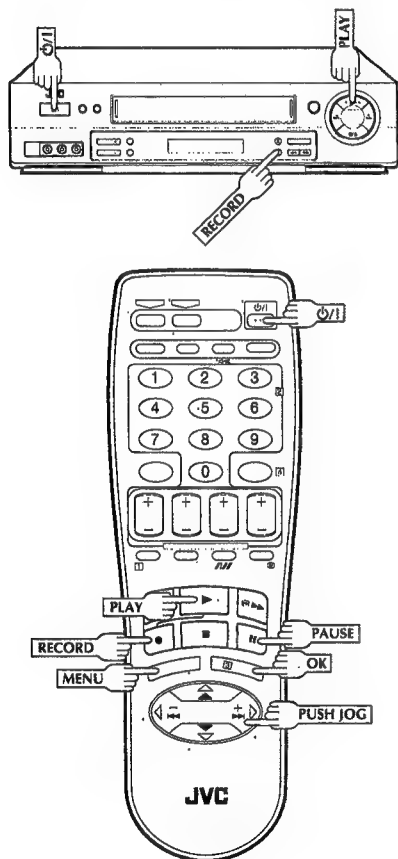
NOTES:

- If you stop recording with the **PAUSE** button to avoid unwanted TV programme material, the audio programme is also cut.
- After finishing simulcast recording, be sure to press the **SIMUL** button to cancel the Simulcast mode, otherwise it is not possible to record on the audio track from the built-in tuner.
- If TV broadcast is interrupted while simulcast recording, external audio input will not be recorded.



B.E.S.T. Picture System

Turn on the TV and select the VIDEO channel (or AV mode).



The B.E.S.T. (Biconditional Equalised Signal Tracking) system checks the condition of the tape in use during recording and playback, and compensates to provide the highest-possible recording and playback pictures. The default setting for both recording and playback is "ON".

Preparation

1 TURN ON THE RECORDER

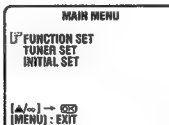
Press $\phi/1$.

2 ACCESS MAIN MENU SCREEN

Press MENU.

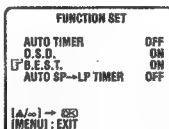
3 ACCESS FUNCTION SET SCREEN

Place the pointer next to "FUNCTION SET" by pressing PUSH JOG $\Delta \nabla$, then press OK or PUSH JOG \triangleright .



4 SELECT MODE

Place the pointer next to "B.E.S.T." by pressing PUSH JOG $\Delta \nabla$, then press OK or PUSH JOG \triangleright to set to "ON" or "OFF".



5 RETURN TO NORMAL SCREEN

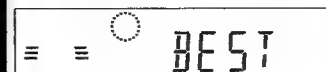
Press MENU.

Recording

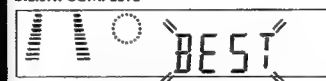
START RECORDING

Press and hold RECORD and press PLAY on the remote, or press RECORD on the recorder.

DURING B.E.S.T.



B.E.S.T. COMPLETE



- The recorder spends approximately 7 seconds assessing the condition of the tape, then begins recording.

NOTES:

- The B.E.S.T. system works for both SP and LP (or EP) modes only after a tape has been inserted and the Record mode is first initiated. It does not work during recording.
- In the case of timer recording, the B.E.S.T. system works before recording is initiated.
- Once the cassette is ejected, the B.E.S.T. data is cancelled. The next time the cassette is used for recording, B.E.S.T. is re-performed.
- Pressing the recorder's RECORD button while "BEST" is displayed does not start Instant Timer Recording (see pg. 16).

ATTENTION

Since the B.E.S.T. system works before recording actually starts, there is a delay of approximately 7 seconds after RECORD and PLAY on the remote are pressed, or RECORD on the recorder is pressed. To make sure you record the desired scene or programme in its entirety, first perform the following steps:

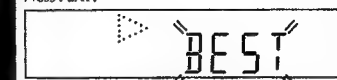
- Press and hold PAUSE and press RECORD to engage the RECORD PAUSE mode.
 - The recorder then automatically checks the condition of the tape and, after approximately 7 seconds, re-enters RECORD PAUSE.
- Press PLAY to start recording.
 - If you want to bypass the B.E.S.T. system and begin recording immediately, set "B.E.S.T." to "OFF" in step 4 on page 18.

Playback

The recorder assesses the quality of the tape once you initiate playback.

START PLAYBACK

Press PLAY.



- The recorder adjusts the playback picture quality based on the quality of the tape in use.
- B.E.S.T. is active during Auto Tracking. "BEST" appears blinking on the recorder's display panel.

NOTES:

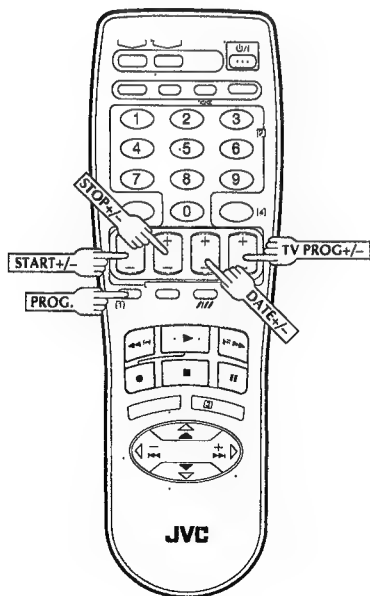
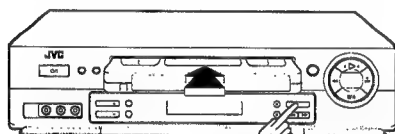
- When watching a tape recorded with "B.E.S.T." set to "ON", it is recommended that you leave B.E.S.T. on during playback as well.
- When watching a rental tape or one recorded on another video recorder, or when using this recorder as the player for editing, set B.E.S.T. to your preference by performing steps 1 through 5 on page 18.
- "BEST" only appears at the beginning of automatic tracking. Even though it doesn't appear after that, the B.E.S.T. function is operative.

Express Timer Programming

Remember, the clock must be set before you can programme the timer (see pg. 9).

Before performing the following steps:

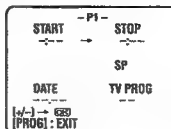
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).
- Select the appropriate colour system by pressing the COLOUR SYSTEM button. (see pg. 28)



1

ACCESS TIMER PROGRAMMING SCREEN

Press **PROG.** (If you're just starting out, "P1" appears.)

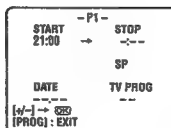


2

ENTER PROGRAMME START TIME

Press **START +/-** to enter the time you want recording to start.

- Press and hold **START +/-** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.



3

ENTER PROGRAMME STOP TIME

Press **STOP +/-** to enter the time you want recording to stop.

- Press and hold **STOP +/-** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.

4

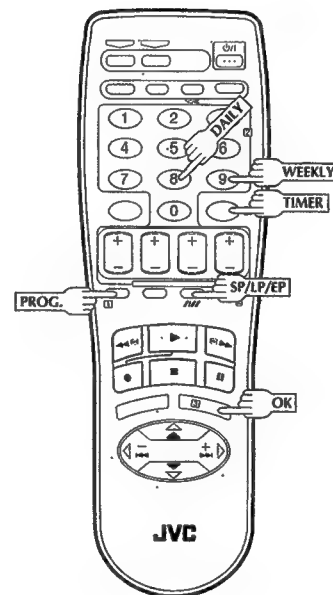
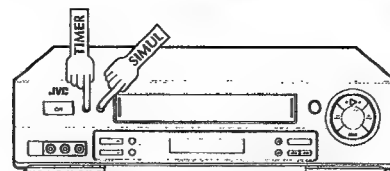
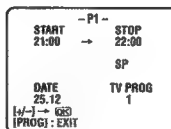
ENTER PROGRAMME DATE

Press **DATE +/-**. (The current date appears on screen. The date you enter appears in its place.)

5

ENTER CHANNEL POSITION

Press **TV PROG +/-**.



6

SET TAPE SPEED

Press **SP/LP/EP** to set the tape speed.

7

RETURN TO NORMAL SCREEN

After confirming all information is correct, press **PROG.** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

- Repeat steps 1 – 7 for each additional programme.

8

ENGAGE RECORDER'S TIMER MODE

Press **TIMER**. The recorder turns off automatically and **⏻** appears on the display panel.

- To disengage the timer, press **TIMER** again.

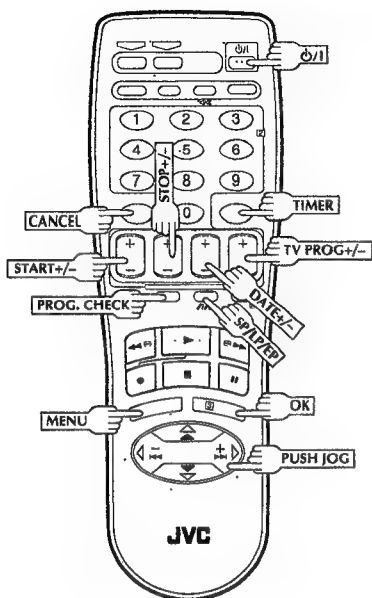
To Timer-Record Weekly Or Daily Serials ...
... anytime during steps 2 through 7, press **WEEKLY** (NUMBER key "9") for weekly serials or **DAILY** (NUMBER key "8") for daily serials (Monday-Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.

NOTE:

You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen. To record the extra programme, you must first cancel any unnecessary programmes (see pg. 22).

To timer record with simulcast...

...While you perform steps 2 – 6, press **SIMUL** at any time; "SIM" appears on the right of TV PROG number. Set the FM tuner to the desired broadcast before the selected programme begins. Then set the FM tuner's timer. If the tuner doesn't have a timer, leave the unit's power turned on.



Check, Cancel And Replace Programmes

1 DISENGAGE TIMER MODE

Press **TIMER**, then press **⏻**.

2 ACCESS PROGRAMME CHECK SCREEN

Press **PROG. CHECK**.

PR	START	STOP	CH	DATE
1	8:00	10:00	3	24.12
2	10:00	10:45	2	25.12
3	11:30	13:00	1	26.12
4				
5				
6				
7				
8				
9				

[PROG CHECK] : NEXT

3 ACCESS PROGRAMME SCREEN

Press **PROG. CHECK** again to check more information. Each time you press **PROG. CHECK**, the next programme's information appears.

START	-P1-	STOP
8:00	→	10:00
		SP
DATE		TV PROG
24:12		3

[PROG CHECK] : EXIT

To cancel or replace a programme...

4 CANCEL OR REPLACE A PROGRAMME

Press **CANCEL** to cancel a programme. To replace a programme, press the appropriate button: **START +/-**, **STOP +/-**, **DATE +/-**, **TV PROG +/-**, **SP/LP/EP** (if/it).

5 RETURN TO NORMAL SCREEN

Press **PROG. CHECK** as many times as necessary. If there are still some programmes remaining, go on to step 6.

6 RETURN TO TIMER MODE

Press **TIMER**.

Auto SP→LP Timer

If, when timer-recording in SP mode, there is not enough tape to record the entire programme, the recorder automatically switches to LP mode (with PAL broadcasts) or EP mode (with NTSC broadcasts) to allow complete recording.

For Example...

Recording a PAL-broadcast programme of 210 minutes in length onto a 180-minute tape

Approximately 150 minutes	Approximately 60 minutes
SP mode	LP mode
Total 210 minutes	

Make sure you set "AUTO SP→LP TIMER" to "ON" at the Function Set screen before the timer-recording starts.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Press **PUSH JOG Δ** to place the pointer next to "FUNCTION SET", then press **OK** or **PUSH JOG ▷**.

3 SELECT MODE

Press **PUSH JOG Δ** to place the pointer next to "AUTO SP→LP TIMER", then press **OK** or **PUSH JOG ▷** to select "ON".

FUNCTION SET	
AUTO TIMER	OFF
O.S.D.	ON
O.E.S.T.	ON
☐ AUTO SP→LP TIMER	ON

[Δ/↵] → [O.S.D.]
[MENU] : EXIT

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- If you have programmed the recorder to timer-record 2 or more programmes, the second programme and those thereafter may not fit on the tape if you set "AUTO SP→LP TIMER" to "ON". In this case, make sure the mode is not engaged, then set the tape speed manually during timer programming.
- In order to ensure that the recording fits on the tape, this feature may leave a slight non-recorded section at the end of the tape.
- There may be some noise and sound disturbance at the point on the tape where the recorder switches from SP to LP (or EP) mode.
- The Auto SP→LP Timer feature is not available during ITR (Instant Timer Recording), and the feature will not work properly with any tapes longer than E-180 or with some tapes of shorter lengths.

Auto Timer

When the Auto Timer is set to ON the timer is automatically engaged when the recorder power is turned off and automatically disengaged when the recorder is powered back on.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Press **PUSH JOG Δ** to place the pointer next to "FUNCTION SET", then press **OK** or **PUSH JOG ▷**.

MAIN MENU	
☐ FUNCTION SET	
TUNER SET	
INITIAL SET	

[Δ/↵] → [O.S.D.]
[MENU] : EXIT

3 SELECT MODE

Press **OK** or **PUSH JOG ▷** to select either "ON" or "OFF".

FUNCTION SET	
☐ AUTO TIMER	OFF
O.S.D.	ON
O.E.S.T.	ON
☐ AUTO SP→LP TIMER	ON

[Δ/↵] → [O.S.D.]
[MENU] : EXIT

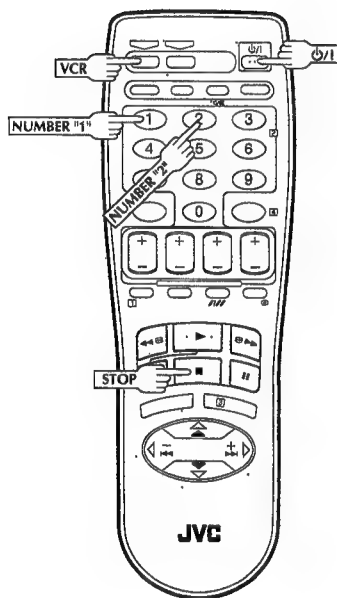
4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTE:

For safety, when Auto timer is set to "OFF", all other recorder functions are disabled while the Timer mode is engaged. To disengage the timer, press **TIMER**.

Remote Control Functions



Remote A/B Code Switching

The remote control is capable of controlling two JVC video recorders independently; one set to respond to the remote control's A code control signals and another set to respond to B code control signals. The remote control is preset to send A code signals because your video recorder is initially set to respond to A code signals. You can easily modify your video recorder to respond to B code signals.

1 REMOVE POWER SUPPLY

Unplug the mains power cord from the mains outlet.

2 SET REMOTE CONTROL CODE

While holding down VCR on the remote control, press the NUMBER key "2" and then press STOP.

3 RE-SUPPLY POWER

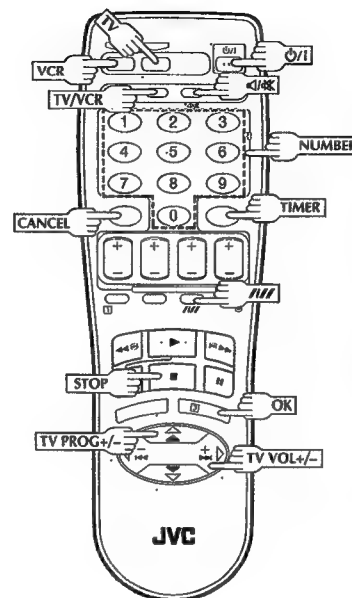
Plug the mains power cord back into the mains outlet.

4 TURN THE RECORDER ON

Press ϕ/I on the remote control. The recorder will now only respond to B code signals.

NOTE:

To set the recorder back to respond to A code signals, repeat the same procedure as shown above except pressing NUMBER key "1" instead of "2" in step 2.



ATTENTION

The remote control can operate not only the video recorder but also some of your TV's functions.

- To operate your video recorder, first press the VCR button to set the remote control to the Video mode.
- To operate your TV, first press the TV button to set the remote control to the TV mode.

Control Your TV Using Additional Buttons

Use the NUMBER keys, and the \equiv button, CANCEL button or TIMER button to select the TV's channel.

- With televisions under Code 01, 02, 03, 05, 07, 15, 16 or 22, the \equiv button corresponds to the 1-digit/2-digit entry switching button (often labelled $-/-$) of your TV's remote control.
- With televisions under Code 01, 08, 18 or 19, the CANCEL button corresponds to the 10 + button, and the TIMER button corresponds to the 20 + button of your TV's remote control.

NOTE:

The way these buttons are used is determined by your TV. Use these buttons as instructed for your TV's remote control.

TV Multi-brand Remote Control

Your remote control can operate the basic functions of your TV set. In addition to JVC TVs, other manufacturer's TVs can also be controlled.

Before you start . . .

- Turn on the TV using its remote control.

1 SET TV BRAND CODE

Refer to the chart below. While holding down TV on the recorder's remote control, enter your TV's brand code using the NUMBER keys, then press STOP. Check if the TV's power goes off as it should. If it does, try other operations (step 2).

- Once you have set the remote control to operate the TV, you don't have to repeat this step until you replace your remote control's batteries.
- SAMSUNG has two codes. If the TV does not function with one code, try entering another.

2 OPERATE TV

First, press TV to set the remote control to TV mode, then press the corresponding button: ϕ/I , TV PROG +/-, TV/VCR, TV VOL +/- (Volume), \square/MUTE (Muting), NUMBER keys.

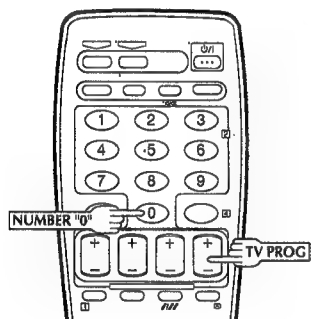
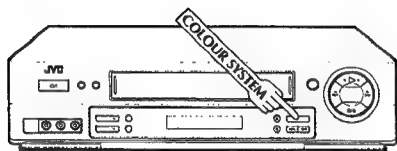
- For some brands of TV, you must press OK after having pressed the NUMBER keys.

IMPORTANT

Although the provided remote control unit is compatible with JVC televisions, as well as many other models, it may not work with your TV, or in some instances, may have limited function capability.

TV BRAND NAME	CODE
JVC	01
PANASONIC	02
SONY	03
SHARP	04
TOSHIBA	05
CHANGHONG	05, 06, 16, 25
BEIJING	05, 27
MITSUBISHI	06
HITACHI	07
SANYO	08
FUNAI	09
AIWA	10
DAEWOO	11
SAMSUNG	12, 16
LG/GOLDSTAR	13
THOMSON	14
FERGUSON	15
PHILIPS	16
TCL	16, 28
GRUNDIG	17
ITT	18
MIVER	19
FINLUX	20
NOKIA	21
NEC	22
JINXING	23
PEONY	23, 24, 25
KONKA	26
NOBLEX	27

Edit To Or From Another Video Recorder



You can use your video recorder as the source player or the recording deck.

1 MAKE CONNECTIONS

Connect the player's AUDIO/VIDEO OUT connector to the recorder's AUDIO/VIDEO IN connector.

- Use the L connector for monaural connection.

2 SET RECORDING DECK'S INPUT MODE

Set to AUX. With this video recorder, press **NUMBER** key "0" and/or **TV PROG** to select depending on the connector being used — "L-1" for the rear panel VIDEO/AUDIO input connectors, or "F-1" for the front panel VIDEO/AUDIO input connectors.

3 START SOURCE PLAYER

Engage its Play mode.

4 START RECORDING DECK

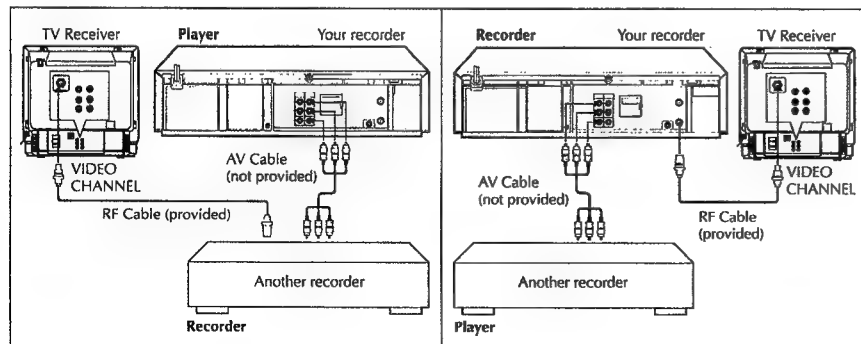
Engage its Record mode.

NOTES:

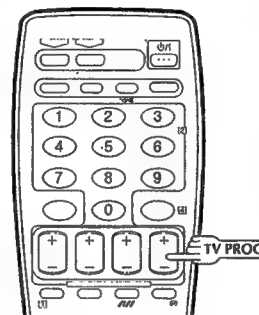
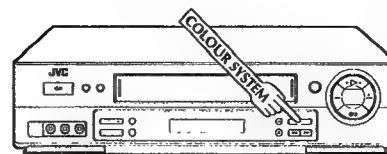
- All necessary cables can be obtained from your dealer.
- NTSC tapes being played back in the NTSC → PAL mode (p. 29) cannot be dubbed to another recorder.
- When you dub an NTSC tape using your recorder as the playback deck, select NTSC 3.58 (or NTSC 4.43) with the **COLOUR SYSTEM** button. (p. 28)

IMPORTANT:

- To edit, both the player and the recorder must be of the same colour system. Press your recorder's **COLOUR SYSTEM** button to select the appropriate colour system.
- For more information on multi-system compatibility, p. 28.



Edit From A Camcorder



You can use a camcorder as the source player and your video recorder as the recorder.

1 MAKE CONNECTIONS

Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's front panel AUDIO/VIDEO input connectors.

- Use the L connector for monaural connection.
- When a Master Edit Control-equipped JVC camcorder is used, the camcorder is capable of controlling the recorder. Refer to the camcorder's instruction manual for operating procedure.

2 SET RECORDER'S INPUT MODE

Press **TV PROG** so that "F-1" appears on the display panel.

3 START CAMCORDER

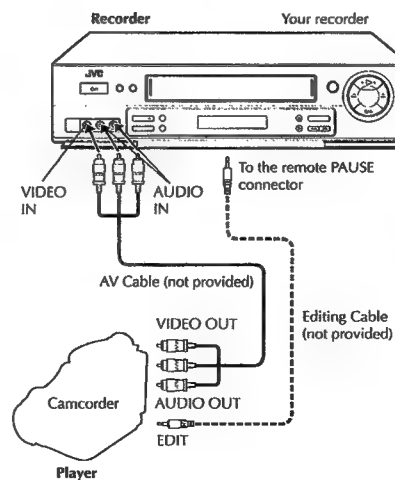
Engage its Play mode.

4 START RECORDER

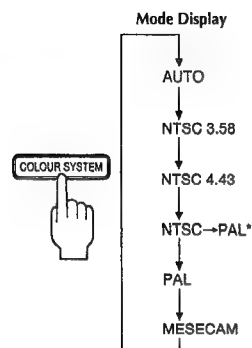
Engage its Record mode.

IMPORTANT:

- To edit, both the player and the recorder must be of the same colour system. Press your recorder's **COLOUR SYSTEM** button to select the appropriate colour system.
- PAL, SECAM and NTSC camcorders can be used as a player for editing.
- For more information on multi-system compatibility, p. 28.



Setting Of The Colour System Select Buttons



* "NTSC→PAL" appears during playback only.

Use the **COLOUR SYSTEM** button on the front panel to select the colour system. Pressing this button changes the mode as illustrated on the left. The On-Screen display will show which mode is selected.

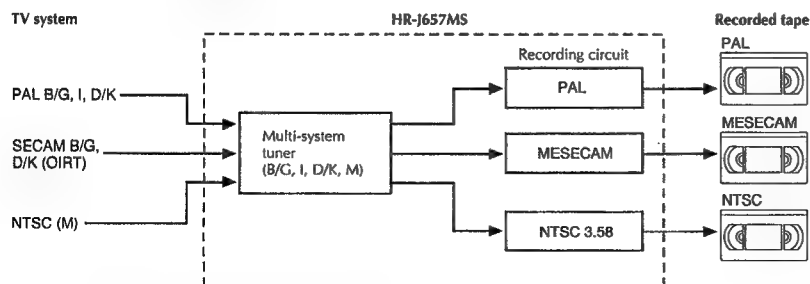
Mode	Description
AUTO	Usually set to this mode. This mode automatically detects PAL, NTSC, SECAM or MESECAM and adjusts to the colour system being recorded or played back. When it does not perform properly, set the colour system manually.
MANUAL	For recording, there is a choice of 4 selectable modes; PAL/MESECAM/NTSC 3.58/NTSC4.43. Select the mode that matches the colour signal being received. For playback, there is an additional mode which allows NTSC tapes to be played back and viewed on PAL TVs.

NOTES:

- In the **AUTO** mode, NTSC signals will be automatically recorded as NTSC 3.58.
- In the **AUTO** mode, NTSC tapes will be played back as NTSC 3.58.
- SECAM signals will always be recorded as MESECAM. Select the **AUTO** or the **MESECAM** mode when recording SECAM signals.
- When playing back a SECAM tape, select the **AUTO** or **MESECAM** mode. The playback picture will always be monochrome.
- In the **NTSC4.43** mode, with some TVs, on-screen displays (Program screen etc.) may roll up or down and there may be a loss of colour. When this happens, select the **AUTO** mode.

Off-Air Recording

The built-in multi-system tuner is capable of receiving PAL B/G, I and D/K, and SECAM B/G and D/K and NTSC broadcasts.

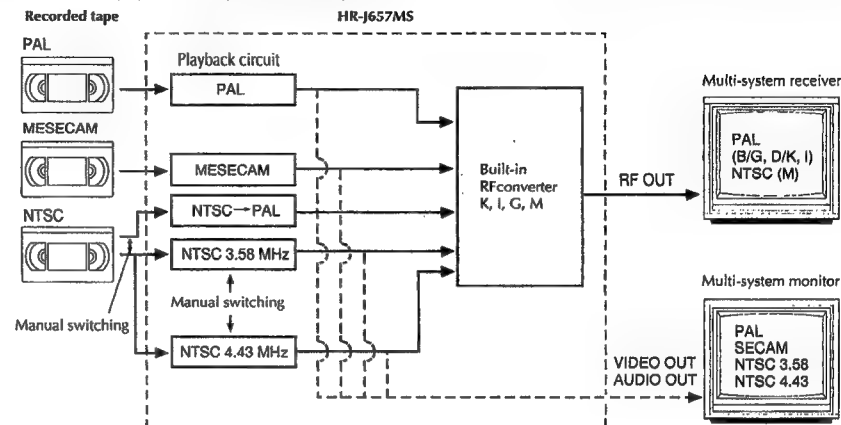


NOTE:

This model does not operate in **BRAZIL (PAL-M)** or **ARGENTINA (PAL-N)**.

Playback

This recorder can play back all 4 types of recorded tape.



NOTES:

When viewing NTSC tapes on a PAL TV set:

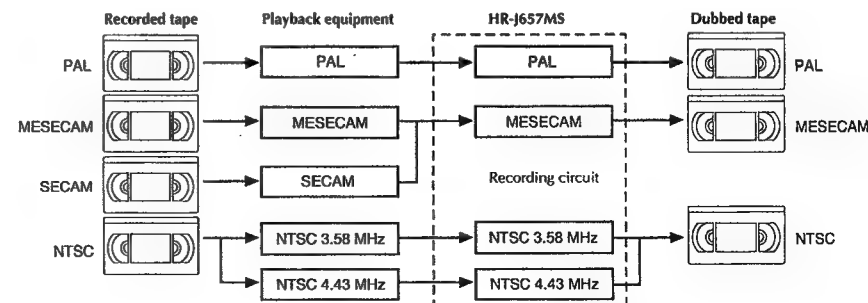
- The picture may shrink vertically with black bars appearing at the top and bottom of the screen. This is not a malfunction on the part of the video recorder nor the TV.
- The picture may roll up or down. This can be corrected using the **V-HOLD** control found on some TVs. (This cannot be corrected if the TV does not have a **V-HOLD** control.)
- During search, still, or frame-by-frame playback, the picture will be distorted, and there may be a loss of colour.

ATTENTION:

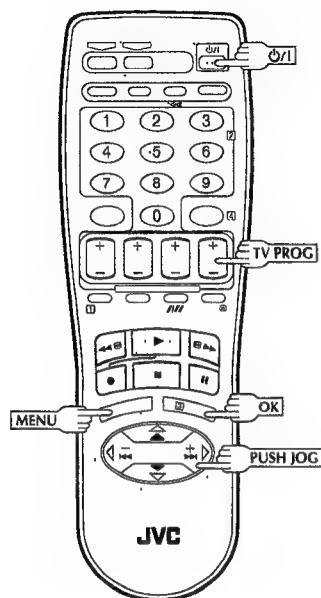
When this recorder is connected to a multi-system TV, the audio signal may not be heard or may be noisy if the colour system select switch of the TV is adjusted to the **AUTO** position. In such a case, set the TV's colour system select switch to the appropriate position which corresponds to the TV system you have selected at the TV System Select screen.

Tape-To-Tape Editing

There are 4 different types of recorded tape, depending on the signal recorded.



Turn on the TV and select the VIDEO channel (or AV mode).



IMPORTANT

Perform the following steps only if auto channel set has not been set correctly by Auto Set Up function (pg. 6) or if you have moved to a different area or if a new station starts broadcasting in your area.

Your recorder needs to memorise all necessary stations in channel positions in order to record TV programmes. Auto Channel Set automatically assigns all receivable stations in your area so that you can call them up with the TV PROG buttons without going through any vacant channels.

Auto Channel Set

TURN ON THE RECORDER

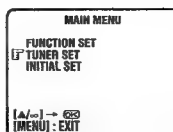
Press ψ/I .

ACCESS MAIN MENU SCREEN

Press MENU.

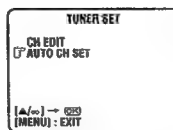
ACCESS TUNER SET SCREEN

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "TUNER SET", then press OK or PUSH JOG \triangleright .



SELECT AUTO CH SET MODE

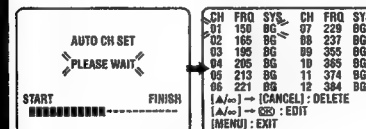
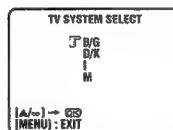
Press PUSH JOG $\Delta \nabla$ to place the pointer next to "AUTO CH SET", then press OK or PUSH JOG \triangleright .



SELECT TV SYSTEM

Press PUSH JOG $\Delta \nabla$ to place the pointer next to the appropriate TV system, then press OK or PUSH JOG \triangleright .

- Auto Channel Set will start.



RETURN TO NORMAL SCREEN

Press MENU.

IMPORTANT

Since your video recorder memorizes all detected stations even if the reception condition is poor, some of those stored stations may produce a noisy picture. To delete those stations, press "Delete A Channel" on page 32.

Manual Channel Set

Store channels that were not stored during Auto Set Up (pg. 6) or Auto Channel Set (pg. 30).

ACCESS TUNER SET SCREEN

Perform steps 1 – 3 of "Auto Channel Set" on page 30.

ACCESS CHANNEL LIST

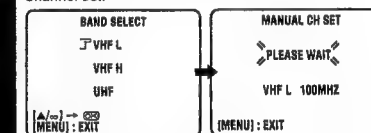
Press PUSH JOG $\Delta \nabla$ to place the pointer next to "CH EDIT", then press OK or PUSH JOG \triangleright .

SELECT POSITION

Press PUSH JOG $\Delta \nabla$ to place the pointer next to an open channel position, then press OK or PUSH JOG \triangleright .

SELECT BAND

Press PUSH JOG $\Delta \nabla$ to place the pointer next to the band of your choice, then press OK to initiate Manual Channel Set.



SET DESIRED STATION

The screen to the right appears when a station is detected.

If you do not want to store the detected station...

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "CONTINUE", then press OK or PUSH JOG \triangleright .

Channel search will resume.

If you want to store the detected station...

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "STORE", then press OK or PUSH JOG \triangleright . The Channel List appears again.

- The blueback screen and the TV picture currently being broadcast appear alternately for 8 seconds each.
- If you want to store another channel, repeat steps 3 – 5.
- When channel search completes for that band, the Band Select screen appears again. To set channels for other bands, select another band and start Manual Channel Set again (pg. step 4 and 5).
- For fine tuning adjustment, see "Fine-Tuning Channels" on page 33.

RETURN TO NORMAL SCREEN

Press MENU.

Delete A Channel

ACCESS TUNER SET SCREEN

Perform steps 1 – 3 of "Auto Channel Set" on page 30.

ACCESS CHANNEL LIST

Press **PUSH JOG** $\Delta \nabla$ to place the pointer next to "CH EDIT", then press **OK** or **PUSH JOG** \triangleright .

SELECT CHANNEL

Press **PUSH JOG** $\Delta \nabla$ to until the channel you want to delete begins blinking.

CH	FREQ	SYS	CH	FREQ	SYS
01	150	BG	07	229	BG
02	165	BG	08	237	BG
03	195	BG	09	385	BG
04	205	BG	10	365	BG
05	213	BG	11	374	BG
06	221	BG	12	384	BG

[Δ/∞] : [CANCEL] : DELETE
[Δ/∞] : [OK] : EDIT
[MENU] : EXIT

DELETE CHANNEL

Press **CANCEL**.

- To re-store it, simply press \triangleleft .
- Repeat steps 3 – 4 as necessary.

CH	FREQ	SYS	CH	FREQ	SYS
01	---	---	07	229	BG
02	150	BG	08	237	BG
03	195	BG	09	385	BG
04	205	BG	10	365	BG
05	213	BG	11	374	BG
06	221	BG	12	384	BG

[Δ/∞] : [OK] : ADD
[MENU] : EXIT

RETURN TO NORMAL SCREEN

Press **MENU**.

Swap Channel Positions

Example: To swap CH03 and CH09.

ACCESS TUNER SET SCREEN

Perform steps 1 – 3 of "Auto Channel Set" on page 30.

ACCESS CHANNEL LIST

Press **PUSH JOG** $\Delta \nabla$ to place the pointer next to "CH EDIT", then press **OK** or **PUSH JOG** \triangleright .

SELECT POSITION (e.g. 03)

Press **PUSH JOG** $\Delta \nabla$ until the section of CH "03" begins blinking, then press **OK** or **PUSH JOG** \triangleright .

- Only "03" will blink.

CH	FREQ	SYS	CH	FREQ	SYS
01	150	BG	07	229	BG
02	165	BG	08	237	BG
03	195	BG	09	385	BG
04	205	BG	10	365	BG
05	213	BG	11	374	BG
06	221	BG	12	384	BG

[0-9] : INPUT CH
[OK] : FINE TUNING
[MENU] : EXIT

SELECT POSITION (e.g. 09)

Press **NUMBER** keys to input "0" and "9".

- The two selected channels will be swapped.
- To cancel the channel swapping, press **PUSH JOG** \triangleleft .

CH	FREQ	SYS	CH	FREQ	SYS
01	150	BG	07	229	BG
02	165	BG	08	237	BG
03	355	BG	09	195	BG
04	205	BG	10	365	BG
05	213	BG	11	374	BG
06	221	BG	12	384	BG

[Δ/∞] : CANCEL
[OK] : OK
[MENU] : EXIT

STORE NEW POSITIONS

Press **OK** or **PUSH JOG** \triangleright .

- Repeat steps 3 – 5 as necessary.

RETURN TO NORMAL SCREEN

Press **MENU**.

Fine-Tuning Channels

ACCESS TUNER SET SCREEN

Perform steps 1 – 3 of "Auto Channel Set" on page 30.

ACCESS CHANNEL LIST

Press **PUSH JOG** $\Delta \nabla$ to place the pointer next to "CH EDIT", then press **OK** or **PUSH JOG** \triangleright .

SELECT CHANNEL TO FINE-TUNE

Press **PUSH JOG** $\Delta \nabla$ until the channel you want to tune begins blinking, then press **OK** twice.

- The "FREQ" number for that channel starts blinking.

CH	FREQ	SYS	CH	FREQ	SYS
01	150	BG	07	229	BG
02	165	BG	08	237	BG
03	195	BG	09	385	BG
04	205	BG	10	365	BG
05	213	BG	11	374	BG
06	221	BG	12	384	BG

[Δ/∞] : FINE TUNING
[OK] : SELECT SYSTEM
[MENU] : EXIT

PERFORM TUNING

Press **PUSH JOG** $\Delta \nabla$ until the picture becomes clearer, then press **OK** or **PUSH JOG** \triangleright .

- Repeat steps 3 and 4 as necessary.

RETURN TO NORMAL SCREEN

Press **MENU**.

TV System Selection – When you see the picture but hear no audio

ACCESS TUNER SET SCREEN

Perform steps 1 – 3 of "Auto Channel Set" on page 30.

ACCESS CHANNEL LIST

Press **PUSH JOG** $\Delta \nabla$ to place the pointer next to "CH EDIT", then press **OK** or **PUSH JOG** \triangleright .

SELECT CHANNEL

Press **PUSH JOG** $\Delta \nabla$ until the channel you want to change its TV system begins blinking, then press **OK** three times.

- The "SYS" display for that channel starts blinking.

CH	FREQ	SYS	CH	FREQ	SYS
01	150	BG	07	229	BG
02	165	BG	08	237	BG
03	195	BG	09	385	BG
04	205	BG	10	365	BG
05	213	BG	11	374	BG
06	221	BG	12	384	BG

[Δ/∞] : SELECT SYSTEM
[OK] : OK
[MENU] : EXIT

SELECT TV SYSTEM

Press **PUSH JOG** $\Delta \nabla$ to select the appropriate TV system (BG \rightarrow DK \rightarrow I \rightarrow M). Then press **OK** or **PUSH JOG** \triangleright .

- Repeat steps 3 and 4 as necessary.

RETURN TO NORMAL SCREEN

Press **MENU**.

Before requesting service for a problem, use this chart and see if you can repair the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your video recorder off for repair.

POWER		
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No power is applied to the recorder.	• The mains power cord is disconnected.	Connect the mains power cord.
2. The clock is functioning properly, but the recorder cannot be powered.	• "⊙" is displayed on the display panel with Auto Timer set to "OFF".	Press the TIMER button to turn the "⊙" indicator off.
3. The remote control won't function.	• The batteries are discharged.	Replace the dead batteries with new ones.
TAPE TRANSPORT		
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape does not run during recording.	• "⏏" is displayed on the display panel.	Press PLAY to turn the "⏏" indicator off.
2. The tape will not rewind or fast-forward.	• The tape is already fully rewound or fast-forwarded.	Check the cassette.
PLAYBACK		
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The playback picture does not appear while the tape is running.	• If you're using the RF OUT connection the TV receiver's channel selector is not set to the VIDEO channel. ... the recorder's VIDEO channel has not been correctly set. • If you're using the AV connection, the TV receiver is not set to the AV mode.	If you are using the RF OUT connection set the TV receiver to the VIDEO channel. (pg. 4) ... Perform "Video Channel Set" (pg. 4) If you are using the AV connection, set the TV to its AV mode.
2. Noise appears during visual search.	• This is normal.	
3. Noise appears during normal playback.	• The automatic tracking mode is engaged.	Try manual tracking. (pg. 12)
4. Noise appears during slow-motion playback.	• The automatic tracking mode is engaged.	Try manual tracking. (pg. 12)
5. Noise appears during still playback.		Press TV PROG + or - a few times to remove the noise bars from the screen.
6. Breaks are noticeable in Hi-Fi soundtrack.	• Automatic tracking is engaged.	Engage and adjust tracking manually. (pg. 12)
7. The playback picture is blurred or interrupted while TV broadcasts are clear.	• The video heads may be dirty.	Consult your JVC dealer.
8. Playback picture has a loss of colour.	• The wrong colour system is selected for the tape being played back. • The wrong colour system was selected during recording.	Select the correct colour system by pressing the COLOUR SYSTEM button. (pg. 28) Once recorded, the signal cannot be corrected. Be sure to choose the correct setting before recording.
9. No sound accompanies the playback picture.	• The TV system you have selected at the TV System Select screen is incorrect.	Set it to the correct position for the TV broadcast system used in your area. (pg. 33.)

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording cannot be started.	• There is no cassette loaded, or the cassette loaded has had its Record Safety tab removed.	Insert a cassette, or using adhesive tape, reseal the slot where the tab was removed.
2. TV broadcasts cannot be recorded.	• "L-1" or "F-1" has been selected as the input mode.	Set to the desired channel.
3. Tape-to-tape editing is not possible.	• The source (another video recorder, camcorder) has not been properly connected. • All necessary power switches have not been turned on. • The input mode is not correct.	Confirm that the source is properly connected. Confirm that all units' power switches are turned on. Set the input mode to "L-1" or "F-1".
4. Camcorder recording is not possible.	• The camcorder has not been properly connected. • The input mode is not correct.	Confirm that the camcorder is properly connected. Set the input mode to "L-1" or "F-1".

TIMER RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Timer recording won't work.	• The clock and/or the timer have been set incorrectly. • The timer is not engaged.	Re-perform the clock and/or timer settings. Press TIMER and confirm that "⊙" is displayed on the display panel.
2. On-screen timer programming is not possible.	• Timer recording is in progress.	Timer programming can't be performed while a timer recording is in progress. Wait until it finishes.
3. "⊙" and "⏏" on the display panel won't stop blinking.	• The timer is engaged but there's no cassette loaded.	Load a cassette with the Record Safety tab intact, or cover the hole using adhesive tape.
4. The cassette is automatically ejected, and "⊙" and "⏏" on the display panel won't stop blinking.	• The loaded cassette has had its Record Safety tab removed.	Remove the cassette and cover the hole with adhesive tape, or insert a cassette with the Record Safety tab intact.
5. "⊙" blinks for 10 seconds and the Timer mode is disengaged.	• TIMER has been pressed when there are no programs in memory, or the timer record information has been programmed incorrectly.	Check the programmed data and re-program as necessary, then press TIMER again.
6. The cassette is automatically ejected, the power shuts off and "⊙" and "⏏" won't stop blinking.	• The end of the tape was reached during timer recording.	The programme may not have been recorded in its entirety. Next time make sure you have enough time on the tape to record the entire programme.

OTHER PROBLEMS		
SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Whistling or howling is heard from the TV during camcorder recording.	<ul style="list-style-type: none"> The camcorder's microphone is too close to the TV. The TV's volume is too high. 	Position the camcorder so its microphone is away from the TV. Turn the TV's volume down.
2. When scanning channels, some of them are skipped over.	<ul style="list-style-type: none"> Those channels have been designated to be skipped. 	If you need the skipped channels, restore them (pg. 31).
3. The channel cannot be changed.	<ul style="list-style-type: none"> Recording is in progress. 	Press PAUSE to pause the recording, change channels, then press PLAY to resume recording.
4. Channel settings that were made manually seem to have changed or disappeared.	<ul style="list-style-type: none"> After the manual settings were made, Auto Channel Set was performed. 	Perform manual setting again.
5. No channels are stored in the recorder's memory.	<ul style="list-style-type: none"> The TV aerial cable was not connected to the recorder when Auto Set Up was performed. 	Connect the TV aerial cable to the recorder properly and turn off the recorder power once, then turn the recorder power back on again. The recorder will try Auto Set Up again (pg. 6).
6. "Low Battery" is displayed on the front display panel after a power outage.	<ul style="list-style-type: none"> The lithium battery is exhausted. 	Replace the lithium battery with a new one. (pg. 5)

PLAYBACK

Q. What happens if the end of the tape is reached during playback or search?

A. The tape is automatically rewound to the beginning.

Q. Can the video recorder indefinitely remain in the still mode?

A. No. It stops automatically after 5 minutes to protect the heads.

Q. During search, slow, still and frame-by-frame playback, I can't hear any audio. What's the problem?

A. This is normal.

Q. When returning from multi-speed search to normal playback, the picture is disturbed. Should I be concerned about this?

A. No, it is normal.

Q. Noise bars appear during multi-speed search. What's the problem?

A. This is normal.

Q. Other than preventing further recording, what effect does removing the Record Safety tab have?

A. It disables marking of index codes.

Q. Sometimes, during Index Search, the video recorder can't find the programme I want to see. Why not?

A. There may be index codes too close together.

RECORDING

Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the beginning of the continuation of recording. Why does this happen?

A. This is normal. It reduces distortion at the pause and resume points.

Q. Can the video recorder indefinitely remain in the Record-Pause mode?

A. No. The video recorder goes to its Stop mode automatically after 5 minutes to protect the heads.

Q. What happens if the tape runs out during recording?

A. The video recorder automatically rewinds it to the beginning.

TIMER RECORDING

Q. "C" and "D" remain lit on the display panel. Is there a problem?

A. No. This is a normal condition for a timer recording in progress.

Q. Can I program the timer while I'm watching a tape or a TV broadcast?

A. You won't see the picture as it is replaced by the on-screen menu, but the audio from the program or tape you're viewing can be heard.

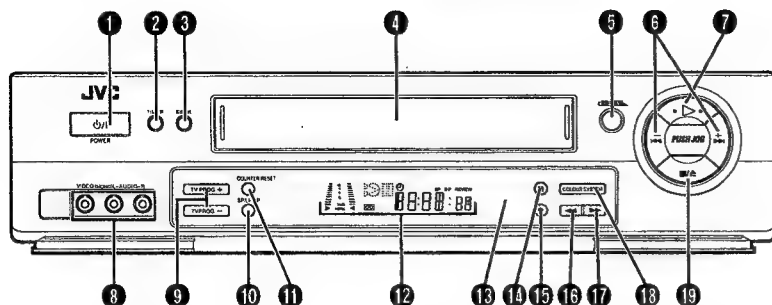
Q. Is it possible to timer-record a TV programme broadcast in 2000?

A. Yes, it is possible.

ATTENTION:

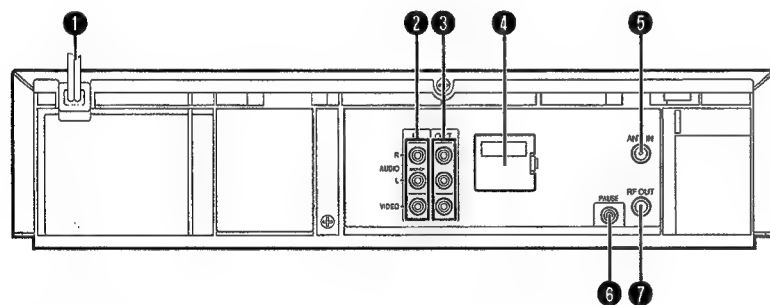
This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the recorder off and unplug the mains power cord. Then plug it in again and turn the recorder on. Take out the cassette. After checking the cassette, operate the unit as usual.

FRONT VIEW



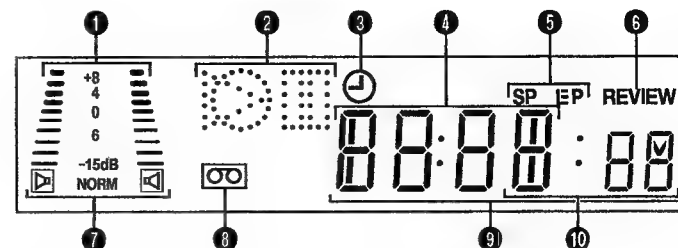
- 1 POWER ψ /I Button \Rightarrow pg. 8
- 2 TIMER Button \Rightarrow pg. 21
- 3 SIMUL Button \Rightarrow pg. 17
- 4 Cassette Loading Slot
- 5 REVIEW Button \Rightarrow pg. 13
- 6 PUSH JOG $\Leftarrow \Rightarrow$ Button \Rightarrow pg. 11
- 7 PLAY Button \Rightarrow pg. 10
- 8 VIDEO/AUDIO Input Connectors \Rightarrow pg. 27
- 9 TV PROG +/- Buttons \Rightarrow pg. 15
- 10 SP/LP/EP Button \Rightarrow pg. 15
- 11 COUNTER RESET Button \Rightarrow pg. 16
- 12 Display Panel \Rightarrow pg. 39
- 13 Infrared Beam Receiving Window
- 14 PAUSE Button \Rightarrow pg. 11
- 15 RECORD Button \Rightarrow pg. 15
- 16 Rewind [REW] Button \Rightarrow pg. 10, 11
- 17 Fast Forward [FF] Button \Rightarrow pg. 10, 11
- 18 COLOUR SYSTEM Button \Rightarrow pg. 28
- 19 STOP/EJECT Button \Rightarrow pg. 10

REAR VIEW



- 1 Mains Power Cord \Rightarrow pg. 3
- 2 AUDIO/VIDEO IN Connectors \Rightarrow pg. 26
- 3 AUDIO/VIDEO OUT Connectors \Rightarrow pg. 3, 26
- 4 Lithium Battery Compartment \Rightarrow pg. 5
- 5 ANT. IN Connector \Rightarrow pg. 3
- 6 Remote PAUSE Connector \Rightarrow pg. 27
- 7 RF OUT Connector \Rightarrow pg. 3

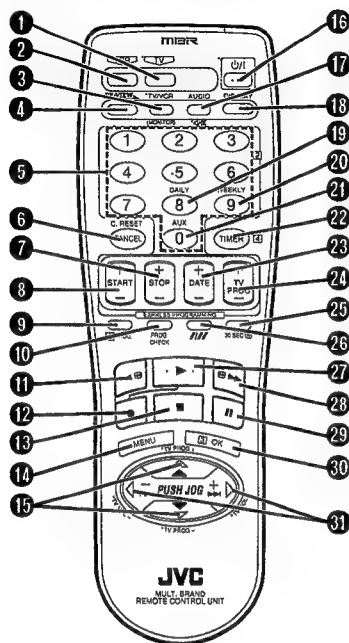
DISPLAY PANEL



- 1 B.E.S.T. Picture System Display \Rightarrow pg. 18
- 2 Audio Level Indicator
- 3 Symbolic Mode Indicators
- 4 "Timer" Indicator \Rightarrow pg. 21
- 5 Channel Display
- 6 Clock Display
- 7 Tape Speed Indicators \Rightarrow pg. 15
- 8 Instant REVIEW Indicator \Rightarrow pg. 13
- 9 Audio Mode Indicator \Rightarrow pg. 14
- 10 "Cassette Loaded" Mark
- 11 Counter Display
- 12 Mode Display (L-1 or F-1)

PLAY: \Rightarrow	STILL: \Rightarrow
FF/REW VARIABLE SHUTTLE SEARCH: \Rightarrow	SLOW: \Rightarrow
	RECORD: \Rightarrow
	RECORD PAUSE: \Rightarrow

REMOTE CONTROL



Buttons with a small dot on the left side of the name can also be used to operate your TV [pg. 25](#).

How To Use

The remote control can operate most of your video recorder's functions, as well as basic functions of TV sets of JVC and other brands. [pg. 25](#).

- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

ATTENTION

- The remote control can operate not only the video recorder but also some of your TV's functions.
- To operate your video recorder, first press the VCR button to set the remote control to the Video mode.
 - To operate your TV, first press the TV button to set the remote control to the TV mode ([pg. 25](#)).

- 1 TV Button [pg. 25](#)
- 2 VCR Button [pg. 25](#)
- 3 TV/VCR Button [pg. 25](#)
- 4 REVIEW Button [pg. 13](#)
- 5 NUMBER Keys [pg. 15](#)
- 6 CANCEL Button [pg. 22](#)
- 7 STOP +/- Button [pg. 20](#)
- 8 START +/- Button [pg. 20](#)
- 9 PROG. Button [pg. 20](#)
- 10 PROG. CHECK Button [pg. 22](#)
- 11 Rewind [REW] Button [pg. 10, 11](#)
- 12 RECORD Button [pg. 15](#)
- 13 STOP Button [pg. 10](#)
- 14 MENU Button [pg. 8](#)
- 15 PUSH JOG $\Delta \nabla$ Button [pg. 6](#)
- 16 TV PROG +/- Button [pg. 25](#)
- 17 POWER ϕ /I Button [pg. 8](#)
- 18 AUDIO Button [pg. 14](#)
- 19 MUTE (TV Muting) Button [pg. 25](#)
- 20 DISPLAY Button [pg. 16](#)
- 21 DAILY Button [pg. 21](#)
- 22 WEEKLY Button [pg. 21](#)
- 23 AUX Button [pg. 26](#)
- 24 TIMER Button [pg. 21](#)
- 25 DATE +/- Button [pg. 20](#)
- 26 TV PROG +/- Button [pg. 15, 20](#)
- 27 30 SEC Button [pg. 13](#)
- 28 Tracking Button [pg. 12](#)
- 29 SP/LP/EP Button [pg. 15](#)
- 30 PLAY Button [pg. 10](#)
- 31 Fast Forward [FF] Button [pg. 10, 11](#)
- 32 PAUSE Button [pg. 11](#)
- 33 OK Button [pg. 4](#)
- 34 PUSH JOG $\triangleleft \triangleright$ ($\triangleleft \triangleleft \triangleright \triangleright$) Button [pg. 11, 13](#)
- 35 TV VOL +/- Button [pg. 25](#)

NOTES:

- When inserting the batteries, be sure to insert in the correct directions as indicated under the battery cover.
- If the remote control doesn't work properly, remove its batteries, wait a short time, replace the batteries and then try again.

SPECIFICATIONS

GENERAL

Power requirement	
Rating	: AC 110 – 240 V~, 50/60 Hz
Operating	: AC 90 – 260 V~, 50/60 Hz
Power consumption	: 22 W
Temperature	
Operating	: 5°C to 40°C
Storage	: -20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 340 mm
Weight	: 3.8 kg
Format	: VHS standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette (PAL/MESECAM)
	: 160 min. with T-160 video cassette (NTSC)
(LP)	: 480 min. with E-240 video cassette (PAL/MESECAM)
(EP)	: 480 min. with T-160 video cassette (NTSC)

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
	: NTSC colour and EIA monochrome signals, 525 lines/60 fields
Recording system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines (PAL/MESECAM)
	: 220 lines (NTSC)
Frequency range	: 70 Hz to 10,000 Hz (Normal audio)
	: 20 Hz to 20,000 Hz (Hi-Fi audio)
Input/Output	: RCA connectors (IN x 2, OUT x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF (Low) 42 – 175 MHz
	(High) 175 – 470 MHz
	UHF 470 – 870 MHz
Aerial output	: UHF channels (Adjustable E28 – E60)
Memory backup time	: Approx. 6 months
	Estimated figure based on supplied fresh battery; actual performance may differ.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6/UM-3" battery x 2, Lithium battery CR2025, Conversion plug*
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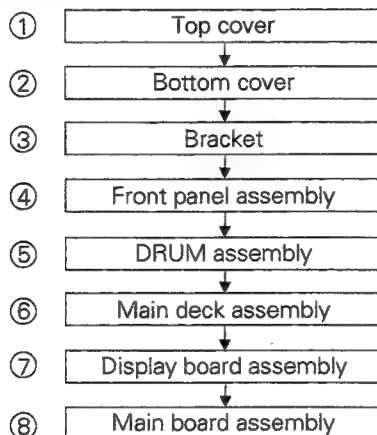
*Not provided in certain areas.

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

SECTION 1 DISASSEMBLY

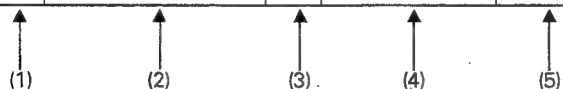
1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), (S2)	
②	BOTTOM COVER	D2	(S3), 7(L1)	
③	BRACKET	D3	2(S4)	



- (1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
- (2) Part name to be removed or installed.
- (3) Fig.No. showing procedure or part location
- (4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook, unlock, release, unplug or unsolder.
- (5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1), (S2)	
②	BOTTOM COVER	D2	(S3), 7(L1)	
③	BRACKET	D3	2(S4)	
④	FRONT PANEL ASSEMBLY	D4	7(L2)	<NOTE 1>
⑤	DRUM ASSEMBLY	D5	3(S5), CN1, WR1, WR2, *CLEANER ASSEMBLY (L3)	<NOTE 2>
⑥	MAIN DECK ASSEMBLY	D6	2(S6), 2(S7), WR3 2(L4)	<NOTE 3>
⑦	DISPLAY BOARD ASSEMBLY	D7	7(L5), *CN7001, *CN7191 REC SAFETY BOARD (L6)	<NOTE 4>
⑧	MAIN BOARD ASSEMBLY	D8	2(S8), (L7)	

<NOTE1>

- Before attaching the Front panel assembly, ensure that the door opener (a) is in the lowered position.

<NOTE2>

- When inserting the flat wire into the connector, be careful not to mistake the positioning of its electrodes.

<NOTE3>

- When it is required to remove the screws (S6) retaining the Main deck assembly, please refer to the "Procedures for Lowering the Cassette holder assembly" (See on pages 1-3).
- The Main deck assembly is also retained by two spacers on the Main board. Therefore, to remove the Main deck assembly, insert radio pliers or a similar tool from the main deck side and pinch the two hooks of the spacers while removing.
- When attaching the Main deck assembly, be careful not to damage the sensors and switches on the Main board (D3001: LED, Q3001: Start sensor, Q3002: End sensor).

<NOTE4>

- The REC safety board assembly is attached to the Display board assembly. It is therefore necessary to remove the REC safety board assembly before removing the Display board assembly.
- When inserting the flat wire into the connector, be careful not to mistake the positioning of its electrodes.

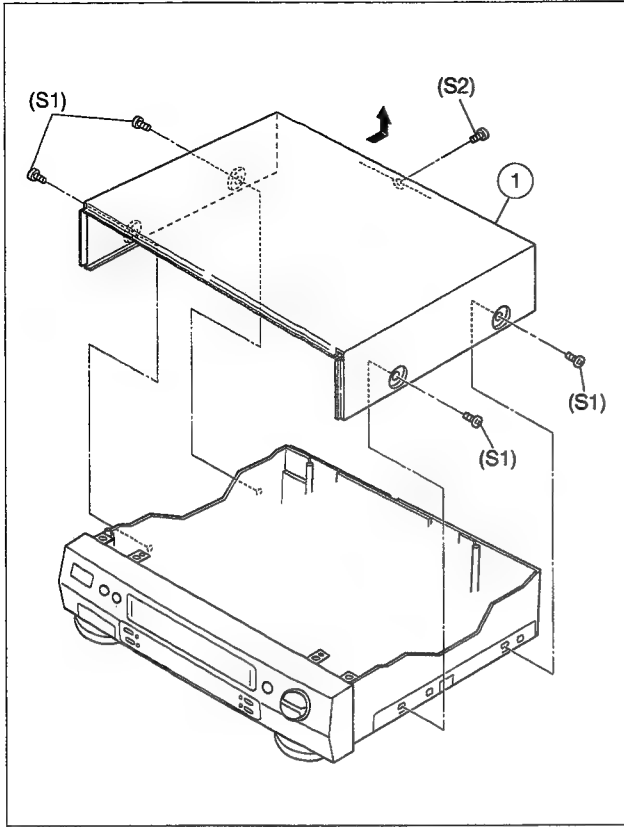


Fig. D1

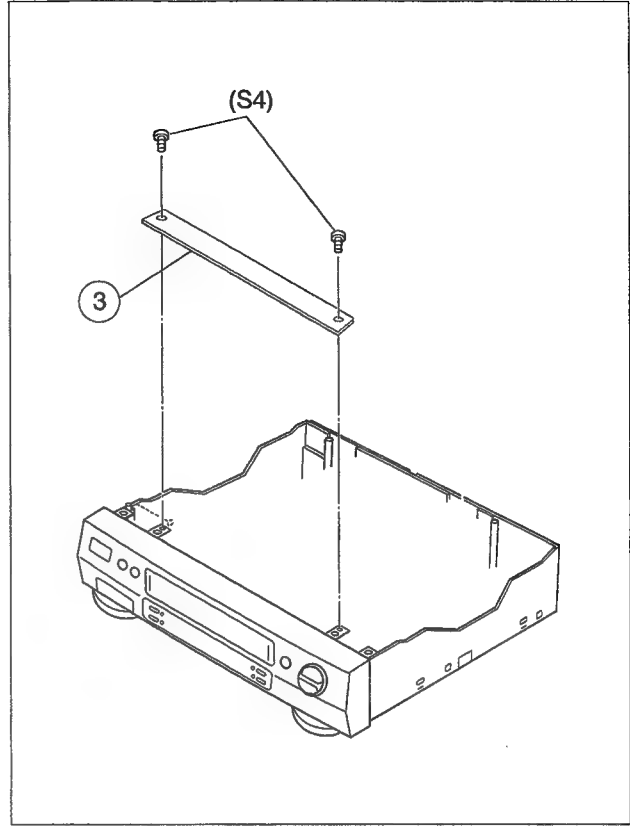


Fig. D3

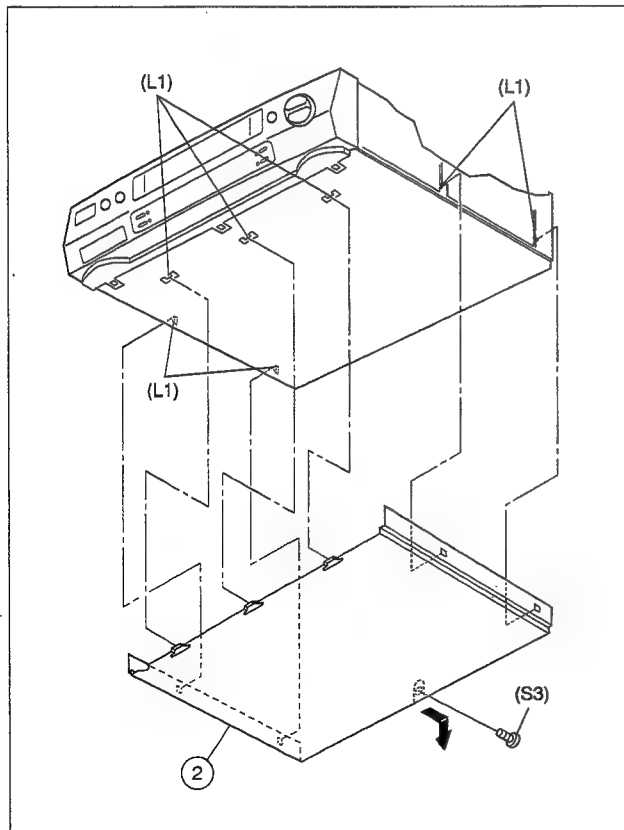


Fig. D2

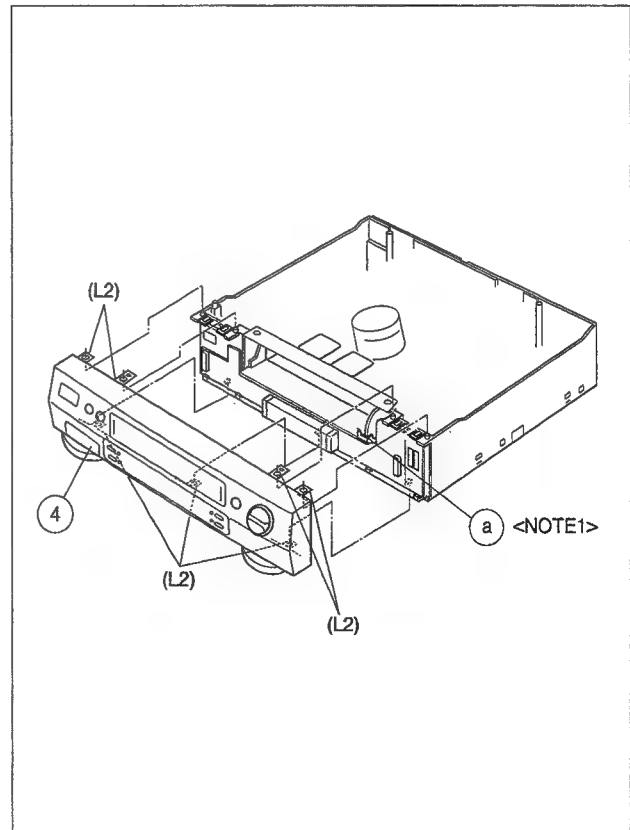


Fig. D4

NOTE : When installing the DRUM assembly, secure the screws(S5) in the order of A, B, C.

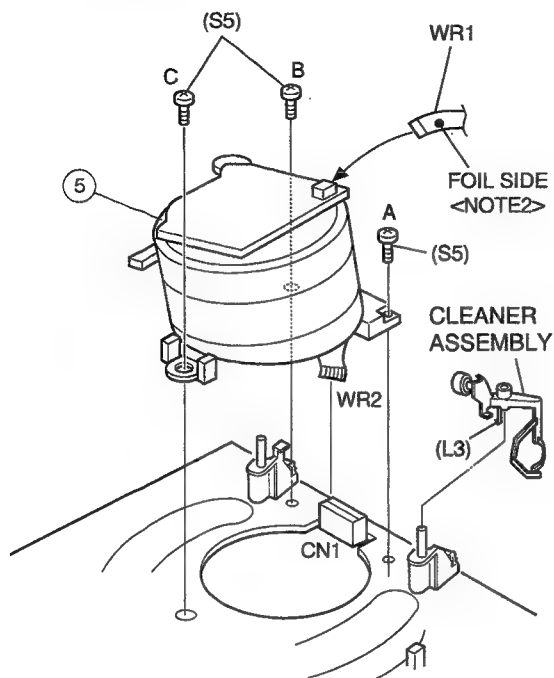


Fig. D5

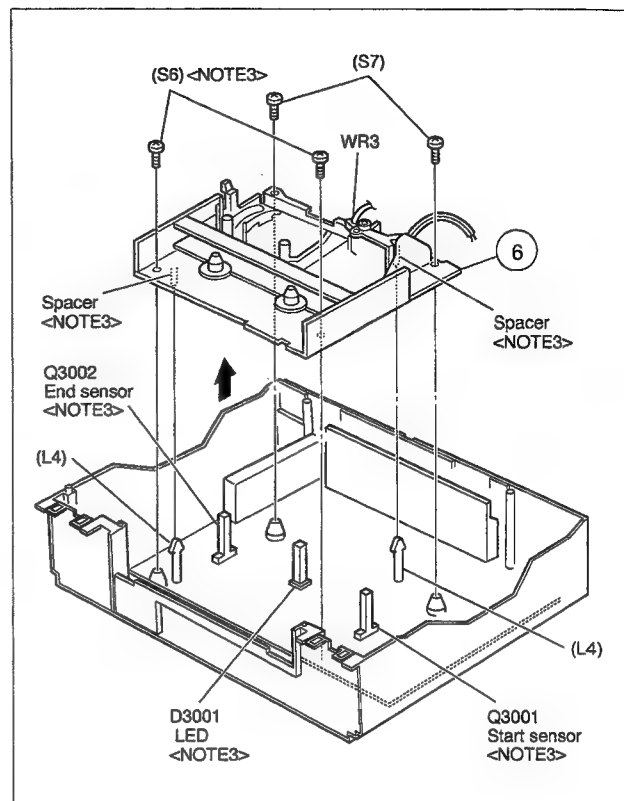


Fig. D6

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two bolts unscrewed when removing the Main deck assembly.

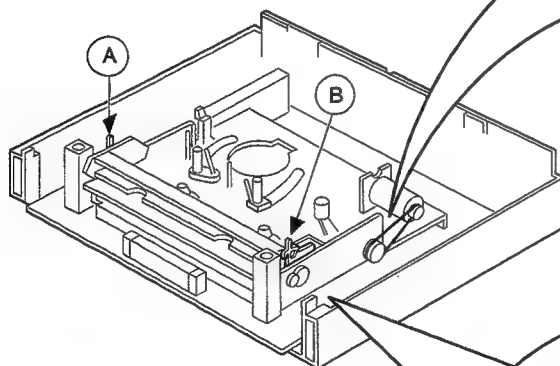


Fig. 1

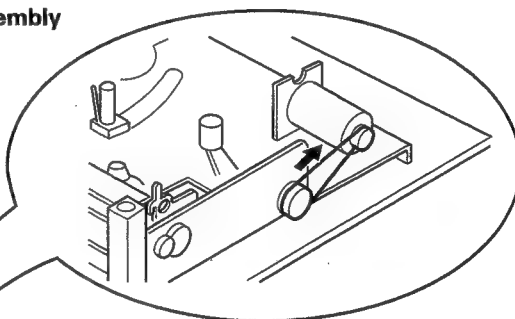


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As both (A) and (B) levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of (A), (B), (B), (A). When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

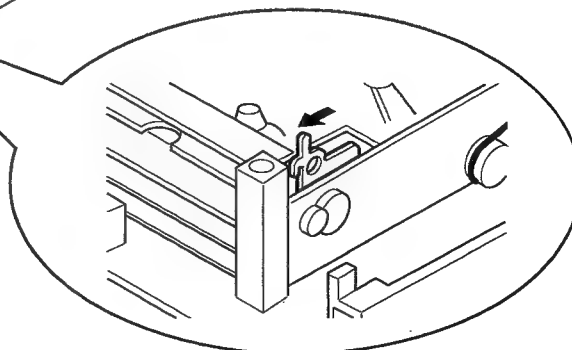


Fig. 3

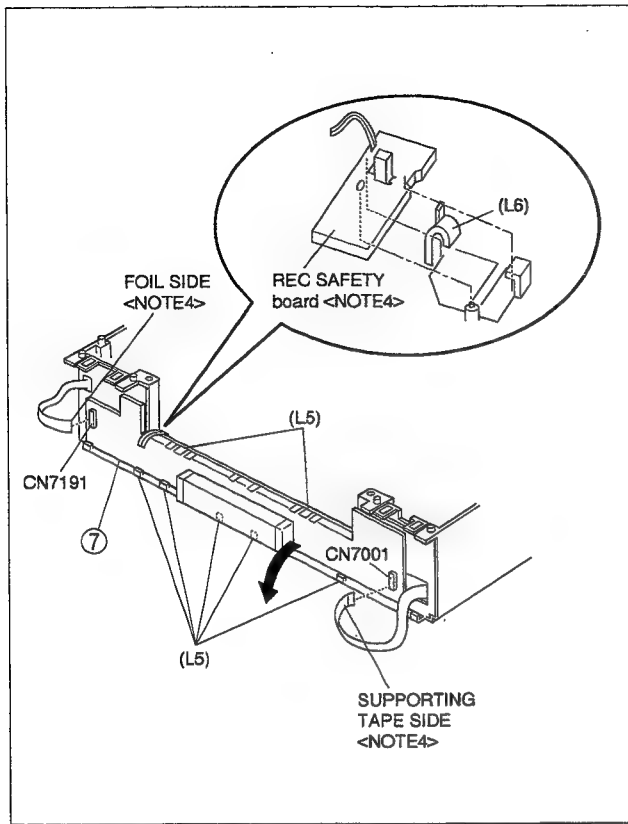


Fig. D7

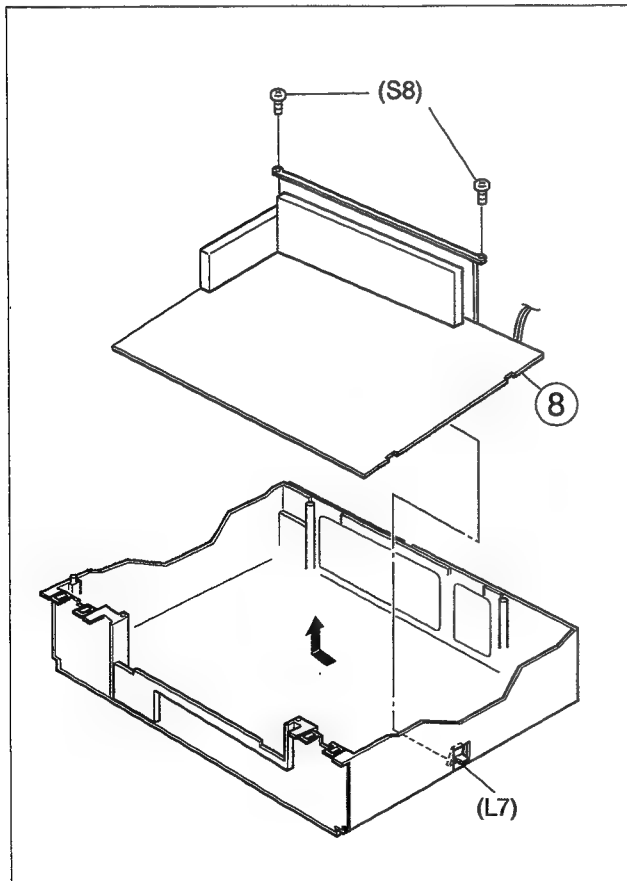


Fig. D8

1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Main deck assembly, this unit is constructed so as to allow the Main deck and the Main board assemblies to be removed together from the Chassis assembly.

1.4.1 How to take out the Mechanism and Main board assemblies

- (1) Remove the Top cover, Bracket and Front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD. Take care not to pull the drum wire (Fig.D5) from CN1).
- (2) Lower the cassette holder, and make the preparations required in order to remove the screws from the Main deck assembly (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD).
- (3) Take out 2 screws (A) and 2 screws (B) as shown in Fig. 1-4-1.
- (4) Remove the flat wires from CN7162 and CN3005 on the Main board assembly.

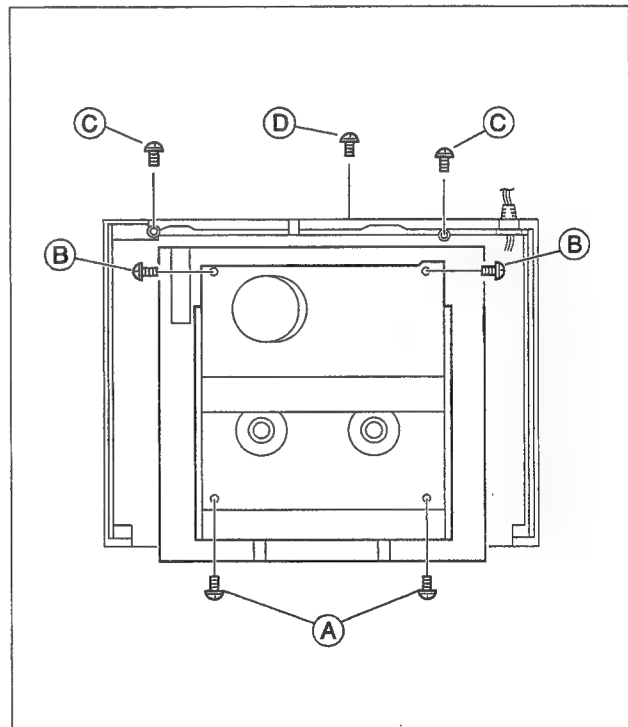


Fig. 1-4-1

- (5) Take out 2 screws (C) and take out 1 screw (D) to install the Bottom cover (See Fig. 1-4-1).
- (6) Remove the hook (E) while holding the edge of the Main board, and remove the Main board and Main deck assemblies together. At this stage be careful of the power cord and prongs of the jacks on the back side (See Fig. 1-4-2).
- (7) Remove the Display board and the REC safety board assemblies (See 1.3 DISASSEMBLY/ASSEMBLY METHOD), then place them on the front side of the Main deck and the Main board assemblies which have been disassembled by procedure (6), and insert the flat wires into CN7162 and CN3005 of the Main board assembly (see Fig.1-4-3).

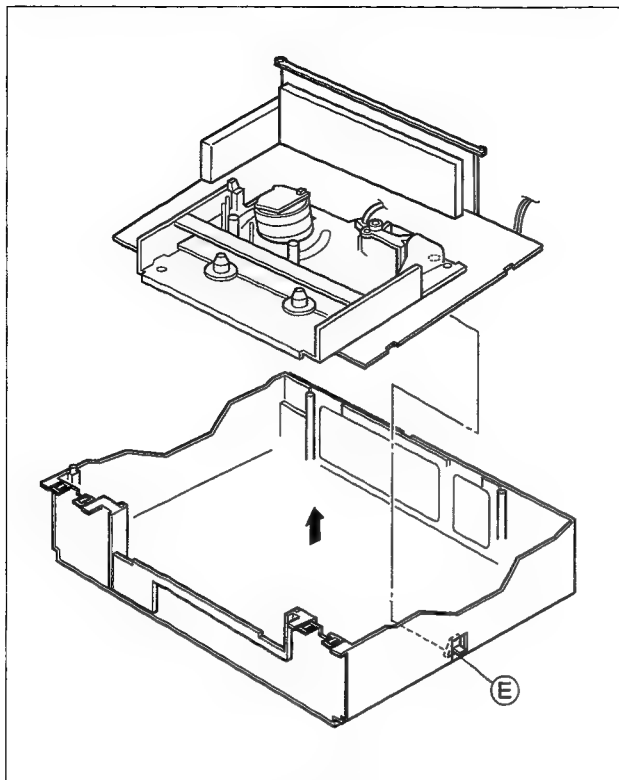


Fig. 1-4-2

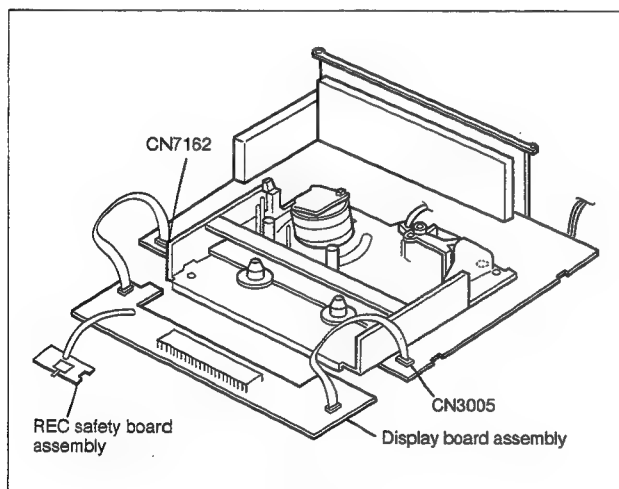


Fig. 1-4-3

1.4.2 Precautions for cassette loading in the "SERVICE POSITION"

The REC safety board assembly detects cassette loading as well as cassette tabs. Therefore, after the assembly has been removed in the "SERVICE POSITION", it is required to set the switch manually on the REC safety board assembly when a cassette is loaded.

1.4.3 Cassette loading and ejection methods in the "SERVICE POSITION"(See Fig. 1-4-3).

- (1) Insert a cassette halfway in the Cassette holder assembly.
- (2) Set the switch on the REC safety board assembly to ON (by pressing the switch).
- (3) As soon as the cassette starts to be loaded, set the switch on the REC safety board assembly to OFF (by releasing the switch).
- (4) Now the desired operation (recording, playback, fast forward, rewind, etc.) is possible in this status (the status shown in Fig.1-4-3).

NOTES: • When performing diagnostics of the tape playback or the recording condition in the "SERVICE POSITION", enter the desired mode before turning the set upside down, and do not change the mode when performing diagnostics while the set is placed upside down. If you want to switch the mode, turn the set to the normal position (the status shown in Fig.1-4-3).

• In the "SERVICE POSITION", the cassette tabs cannot be detected and recording becomes possible even with a cassette with broken tabs such as the alignment tape. Be very careful not to erase important tapes.

- (5) The switch on the REC safety board assembly does not have to be operated when ejecting a tape. But be sure to turn the set to the normal position before ejecting the tape.

- (8) Plug the power cord into an AC outlet, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)

1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.5.1 How to set the "MECHANISM SERVICE MODE"

- (1) Unplug the power cord from an AC outlet.
- (2) Connect TPGND and TP7001 (TEST) on the Display board assembly using a jumper wire.
- (3) Plug the power cord into an AC outlet.
- (4) Set the power switch to ON.
- (5) With lock levers (A)(B) on the left and right sides of the Cassette holder assembly are pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers (A)(B), refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
- (6) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

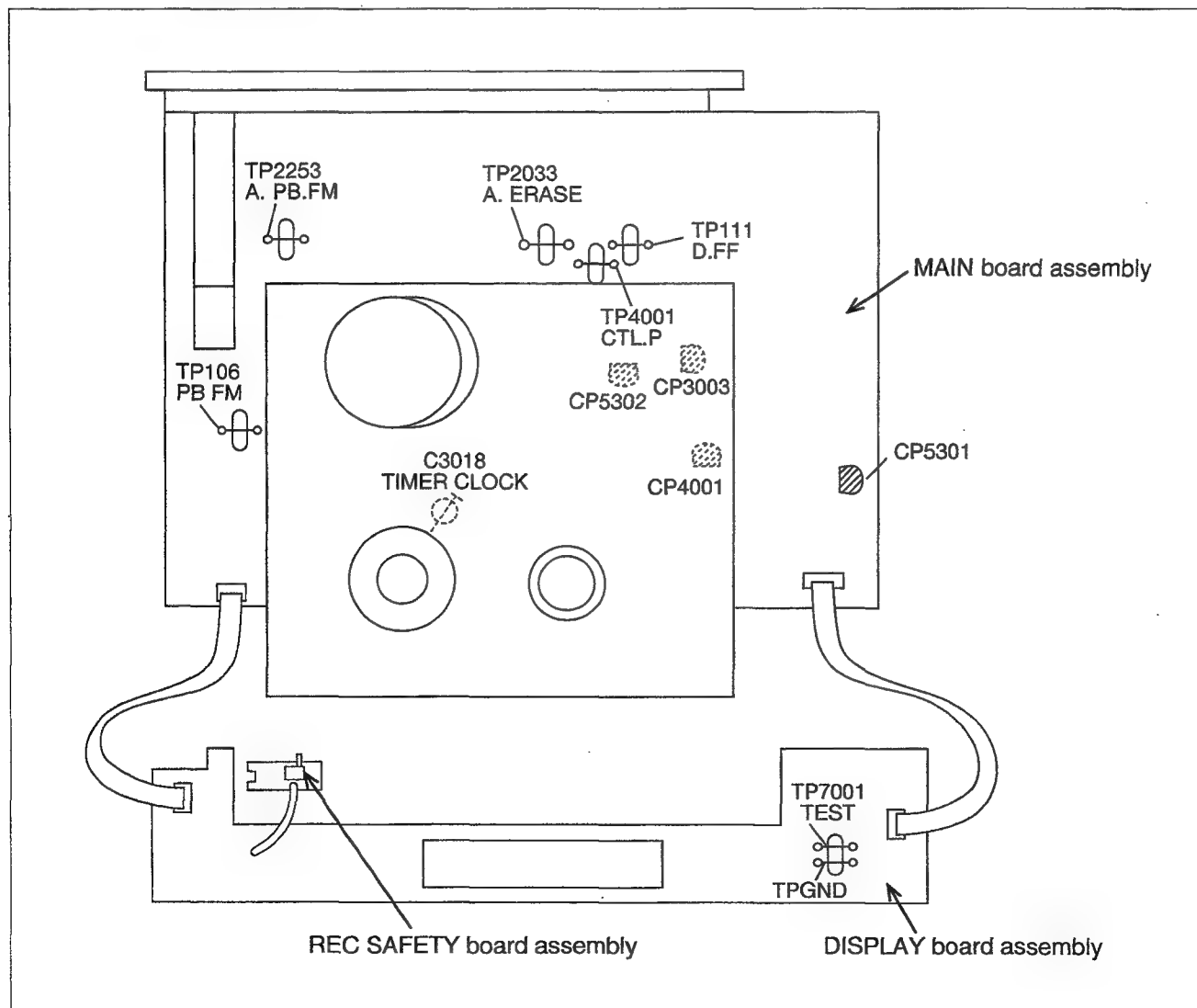


Fig. 1-5-1

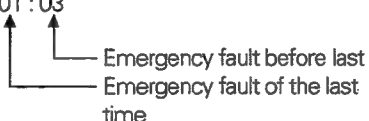
1.6 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.6.1 How to display record of an emergency faults

Note: Put the unit into A mode by using the VCR remote control. (When it is in B mode, the preset remote control codes are not accepted.)

- (1) Press "N" button of the presetting unit more than 2 seconds and the two previous emergency faults are shown in the LED or FDP.
- (2) Press "N" button of the presetting unit again to return to the normal mode.

[Example] E : 01 : 03


[Example] E : — : — ← No record of emergency

1.6.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.6.2 Detail of emergency faults

EMG DATA	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent. (for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 06	CAPSTAN FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-6-1 EMERGENCY FAULTS

1.7 SYSCON CIRCUIT

1.7.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	IND(L)	-	NC
2	IND(R)	-	NC
3	PERI 1S	IN	INPUT FOR THE TERMINAL SLID SW POSI IN THE SAT MODE
4	INDEX	IN/OUT	DETECTION SIGNAL FOR SERVO INDEX
5	AVSS	-	GND FOR ANALOG CIRCUIT
6	TEST	-	GND
7	X2	-	TIMER CLOCK (32.768 KHz)
8	X1	-	TIMER CLOCK (32.768 KHz)
9	VSS	-	GND
10	OSC1	-	MAIN SYSTEM CLOCK (10 MHz)
11	OSC2	-	MAIN SYSTEM CLOCK (10 MHz)
12	RESET	-	RESET TERMINAL (RESET ON:L)
13	(NMI)	-	NC
14	PS SECAM(H)	IN	NC
15	LOCK(L)	IN	(TUNING PLL LOCK DETECT:L)
16	SYNC DET	IN	DETECTION OF VIDEO SYNC SIGNAL (DETECTED:H)
17	PWER DOWN	IN	DETECTION SIGNAL FOR POWER DOWN
18	SQ REC(L)	-	NC
19	P.MUTE(L)	OUT	PICTURE MUTE CONTROL (MUTE:L)
20	R.PAUSE	IN	REMOTE PAUSE CONTROL
21	SECAM DET	-	NC
22	NC	-	NC
23	A.WIDE	-	NC
24	A.EFFECT	-	NC
25	A.MUTE	OUT	AUDIO MUTE CONTROL (MUTE ON:H)
26	TS BUSY	-	NC
27	TS CS	-	NC
28	TM CLOCK	OUT	CLOCK SIGNAL ON THE BUS LINE FROM TIMER TO M-CTL
29	TM CS	OUT	CHIP SELECT SIGNAL ON THE BUS LINE FROM TIMER TO M-CTL
30	TM BUSY	IN	BUSY SIGNAL ON THE BUS LINE FROM TIMER TO M-CTL
31	TM DATA0	IN/OUT	DATA ON THE BUS LINE
32	TM DATA1	IN/OUT	DATA ON THE BUS LINE
33	TM DATA2	IN/OUT	DATA ON THE BUS LINE
34	TM DATA3	IN/OUT	DATA ON THE BUS LINE
35	TM DATA4	IN/OUT	DATA ON THE BUS LINE
36	TM DATA5	IN/OUT	DATA ON THE BUS LINE
37	TM DATA6	IN/OUT	DATA ON THE BUS LINE
38	TM DATA7	IN/OUT	DATA ON THE BUS LINE
39	H.REC(H)	OUT	HIFI AUDIO REC MODE CONTROL SIGNAL (REC:H)
40	N.REC(H)	OUT	NORMAL AUDIO REC MODE CONTROL SIGNAL(REC:H)

1.7.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
41	MS_RESET	OUT	RESET SIGNAL FOR THE MECHANISM CONTROL IC(IC3301)
42	CNR_ON(H)	-	NC
43	TU DATA	OUT	TUNING DATA
44	D.MUTE(H)	-	NC
45	SECAM TU ON(L)	OUT	TUNER "L" SYSTEM MODE:H
46	TU CE	OUT	CHIP ENABLE OF THE TUNER UNIT
47	TU CLOCK	OUT	CLOCK FOR DATA TRANSFER TO THE TUNER UNIT
48	DK(H)/FORCE(L)	-	NC
49	SECAM VL(H)	OUT	TUNER SYSTEM "L" MODE : L
50	RCIN	IN	DATA INPUT OF THE REMOTE CONTROL UNIT
51	NTSC(H)	-	NC
52	FULL_E_ON	-	NC
53	V.SYNC	IN	INPUT FOR THE VIDEO SYNC
54	P.SAVE(L)	-	NC
55	CCIR(L)	OUT	EXCEPT FOR NTSC:L
56	OSD CS	OUT	CHIP SELECT FOR THE ON-SCREEN IC
57	S2-OUT	OUT	SERIAL DATA TRANSFER OUTPUT FROM THE FDP DRIVER TO THE ON-SCREEN IC
58	S2-IN	IN	SERIAL DATA TRANSFER OUTPUT FROM THE ON-SCREEN IC TO FDP DRIVER
59	S2-CLK	OUT	SERIAL DATA TRANSMISSION CLOCK FROM THE FDP DRIVER TO THE ON-SCREEN IC
60	INSERT(L)	-	NC
61	STB	OUT	PERMISSION SIGNAL FOR CLOCK OUTPUT (STROBE SIGNAL)
62	SPH/PSL	-	NC
63	VCC	-	SYSTEM POWER
64	SEC TR(H)	-	NC
65	TITLE REC	-	NC
66	NC	-	NC
67	CTL_CLOCK	IN	LINEAR TIME COUNTER INPUT
68	SECAM(H)	-	NC
69	I2C DATA	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR EE PROM
70	I2C CLOCK	IN/OUT	SERIAL DATA TRANSMISSION CLOCK FOR EE PROM
71	D.FF	IN	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
72	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
73	SHTLB	-	NC
74	SHTL(L)/SHTLA	-	NC
75	JSA	-	NC
76	JSB	-	NC
77	RF AGC	-	NC
78	REC LEVEL V	-	NC
79	AFT/S.CURVE	IN	TUNING CHECK
80	SCRAMBLE(H)	-	NC

Table 1-7-2 SYSCON CPU pin function(2/2)

1.7.3 Syscon CPU pin function (IC3301) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	A.ENV/ND(L)	IN	INPUT THE AVERAGE OF FMA PLAYBACK SIGNAL-A (AUTO TRACKING AND FMA NON-RECORD DETECTION)
2	VIDEO ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
3	6.5H DET	IN	6.5H DETECTION SIGNAL FOR SERVO CIRCUIT
4	REC SF	IN	DETECTION SIGNAL FOR REC SAFETY/CASSETTE INSERT SWITCH
5	AVSS	-	GND FOR ANALOG CIRCUIT
6	TEST	-	GND
7	X2	-	NC
8	X1	-	NC
9	VSS	-	GND
10	OSC1	-	MAIN SYSTEM CLOCK (10 MHz)
11	OSC2	-	MAIN SYSTEM CLOCK (10 MHz)
12	MS_RESET	-	RESET TERMINAL (RESET ON:L)
13	(NMI)	-	NC
14	LSC	IN	MECHANISM MODE DETECT SWITCH (C)
15	LSB	IN	MECHANISM MODE DETECT SWITCH (B)
16	LSA	IN	MECHANISM MODE DETECT SWITCH (A)
17	RAE OUT	-	NC
18	C/M E06	OUT	SPEED CONTROL FOR CAP MOTOR
19	S.SENS	IN	START SENSOR
20	E.SENS	IN	END SENSOR
21	I2C CLOCK	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
22	TU FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
23	SUP FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
24	CTL CLOCK	IN	CONTROL PULSE INPUT
25	I2C DATA	IN/OUT	I/O DATA FOR MEMORY IC
26	LCM1	OUT	MODE MOTOR DRIVE CONTROL
27	LCM2	OUT	MODE MOTOR DRIVE CONTROL
28	LCM3	OUT	MODE MOTOR DRIVE CONTROL
29	TM CS	IN	CHIP SELECT SIGNAL ON THE BUS LINE FROM TIMER TO M-CTL
30	TM CLOCK	IN	CLOCK SIGNAL ON THE BUS LINE FROM TIMER TO M-CTL
31	SLOW P/PAL_EP_CTL	OUT	MEMORY TIMING CONTROL IN THE SLOW MODE
32	LP SHORT(H)	-	NC
33	SP SHORT(H)	-	NC
34	TM DATA7	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL
35	TM DATA6	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL
36	TM DATA5	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL
37	TM DATA4	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL
38	TM DATA3	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL
39	TM DATA2	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL
40	TM DATA1	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL

Table 1-7-3 SYSCON CPU pin function(1/2)

1.7.4 Syscon CPU pin function (IC3301) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
41	TM DATA0	IN/OUT	DATA ON THE BUS LINE FROM TIMER TO M-CTL
42	TM BUSY	OUT	BUSY SIGNAL ON THE BUS LINE FROM TIMER TO M-CTL
43	N REC START(H)	OUT	NORMAL AUDIO SOUND RECORDING START
44	H REC START(L)	OUT	HIFI AUDIO SOUND RECORDING START
45	VPCTL	OUT	"V.PULSE CONTROL, V COMPENSATION DURING SPECIAL PLAYBACK"
46	P.CTL(H)	OUT	CONTROL SIGNAL FOR SW POWER SUPPLY
47	EE(L)	-	NC
48	FLY E ON(H)	-	NC
49	VSC CLOCK	-	NC
50	VSC DATA	-	NC
51	RY-REV(L)	-	NC
52	CTL C/D	IN	DETECTION SIGNAL FOR CONTROL PULSE MODE/TAPE RUNNING/BLANK
53	DDFG	-	NC
54	DDSPDCTL	-	NC
55	DDCREV	-	NC
56	DDCFWD	-	NC
57	VIDEO DATA	-	NC
58	SP(L)	-	NC
59	VIDEO CLK	-	NC
60	E.P.CTL/IP ON(H)	-	NC
61	V.UP(H)	-	NC
62	TRICK	-	NC
63	VCC	-	SYSTEM POWER
64	SLOW_REV	-	NC
65	1/2_EP/3.58NTSC	-	NC
66	S_DATA	OUT	SERVO SERIAL DATA OUTPUT
67	CAP REV(L)	OUT	CAPSTAN MOTOR REVERSE CONTROL (FWD:H/REV:L)
68	DUTY I/O	IN/OUT	DETECTION SIGNAL FOR INDEX DATA
69	CAP FG	IN	DETECTION SIGNAL FOR MODE/TAPE RUNNING/BLANK
70	PAUSE(L)	OUT	STOP CONTROL SIGNAL FOR CAPSTAN MOTOR
71	D.FF	IN	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
72	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
73	SCASS	-	NC
74	SB-G	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
75	DRUM V	OUT	VOLTAGE CONTROL SIGNAL FOR DRUM MOTOR DRIVE
76	CAP V	OUT	VOLTAGE CONTROL SIGNAL FOR CAPSTAN MOTOR SPEED
77	DD ABS	-	NC
78	S(H)	OUT	S-VHS MODE:H
79	HEAD.SEL	-	NC
80	PROTECT	IN	DETECTION SIGNAL FOR SW POWER SUPPLY

Table 1-7-4 SYSCON CPU pin function(2/2)

SECTION 2 MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

2.1.1 Precautions

- (1) Unplug the power cable of the main unit before using your soldering iron.
- (2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
- (3) Do not randomly handle the parts without identifying where the trouble is.
- (4) Exercise enough care not to hurt yourself, especially your finger nails, during the repair work.
- (5) When installing the front panel assembly, be sure to hook the lug on the back side of cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE)

2.1.3 Manually Removing the Cassette Tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

- (1) Unplug the power cable and remove the top cover, bracket and front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD)
- (2) Unload the cassette by manually turning the unloading motor of the main deck assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1)
- (3) Bring the pole base assembly (on the supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
- (4) Move the top plate toward the drum while holding down the lug **A** of the bracket retaining the top plate. Likewise hold part **B** down and remove the top plate. The spring plate **C** is then brought under the cassette lid. Then remove the top plate by pressing the whole cassette tape down. (Note 1) (See Fig.2-1-2).
- (5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
- (6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

Note: The spring plate of the top plate is sharp-edged. Take care not to hurt yourself.

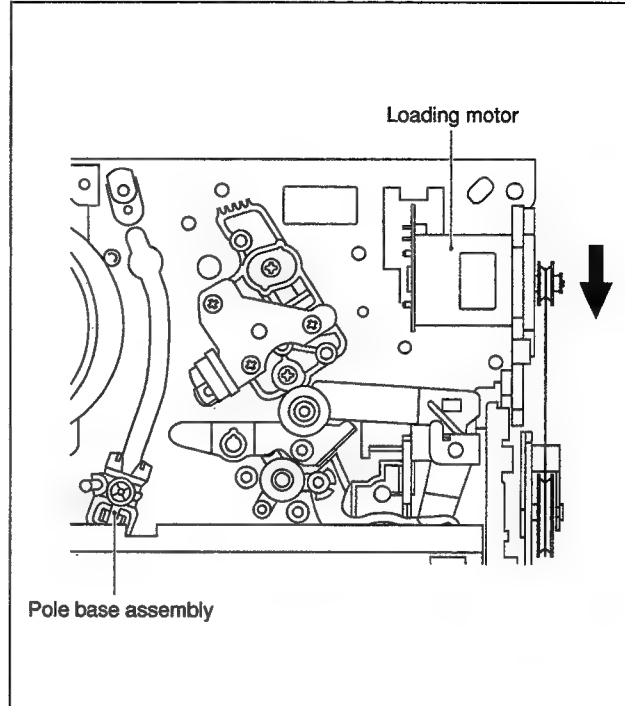


Fig. 2-1-1

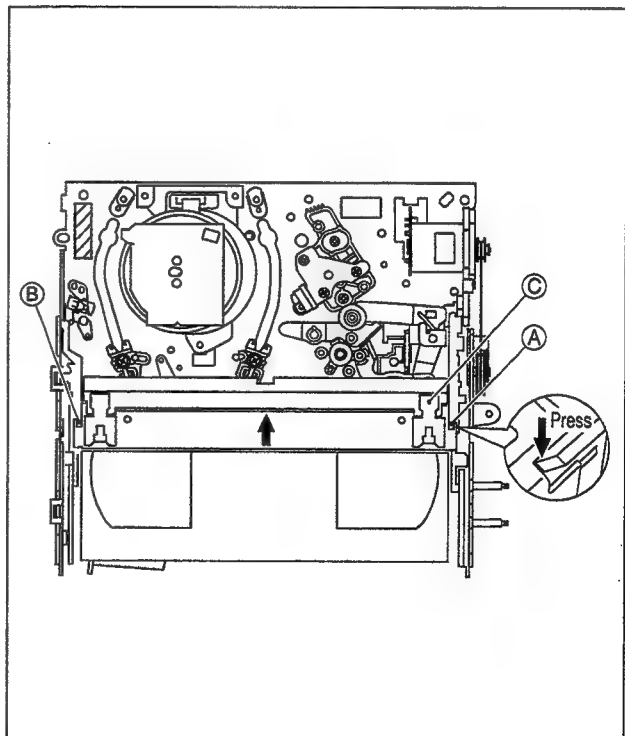


Fig. 2-1-2

2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

- (1) Unplug the power cable and remove the top cover, bracket and front panel assembly (See 1.3 DISASSEMBLY/ASSEMBLY METHOD).
- (2) While keeping the tension arm of the main deck assembly free from tension, pull the tape on the pole base assembly out of the guide roller (on the supply or take-up side) (See Fig.2-1-3).
- (3) Remove the top plate as done in Step (4) of "1 In case of electrical failures" and remove the guide pole cap at the same time. (See Fig.2-1-4).
- (4) While lifting the cassette tape lid, hold the cassette tape case and pinch roller by the fingers and move them toward the loading motor to relieve pressure on the tape. Then remove the tape while taking the cassette case out of the cassette holder. (See Fig.2-1-4).
- (5) Re-place the guide pole cap and take up the slack of the tape into the cassette.

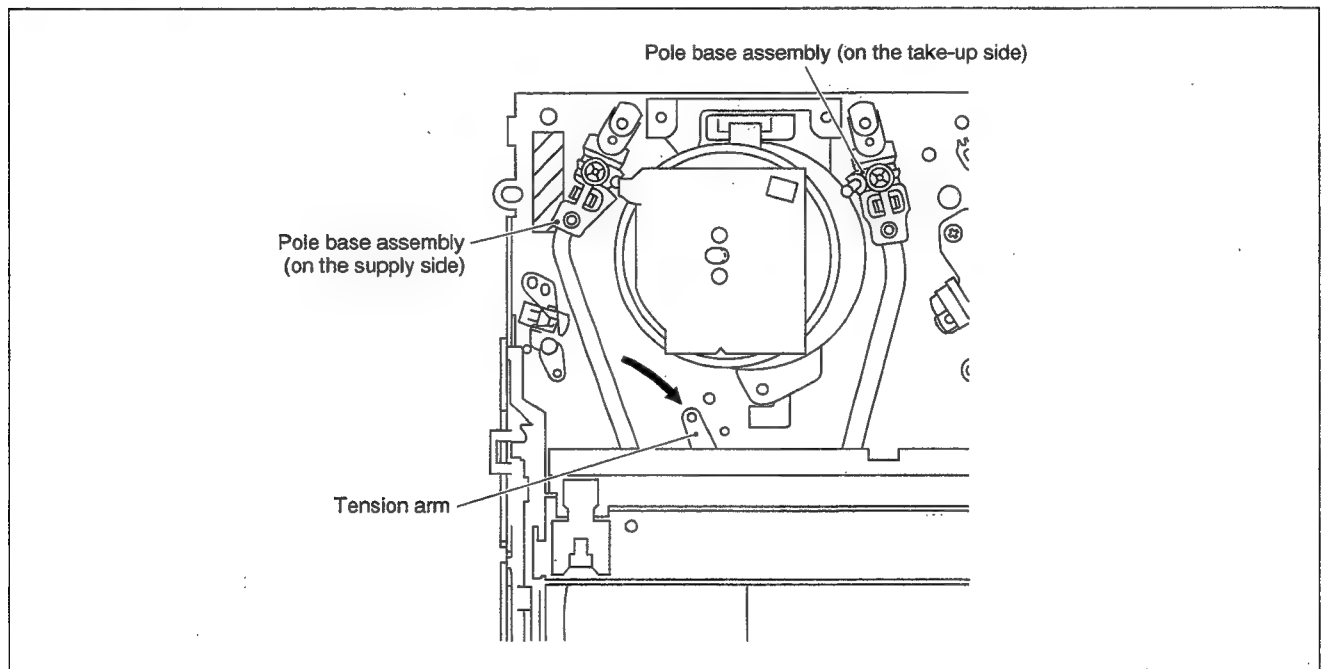


Fig. 2-1-3

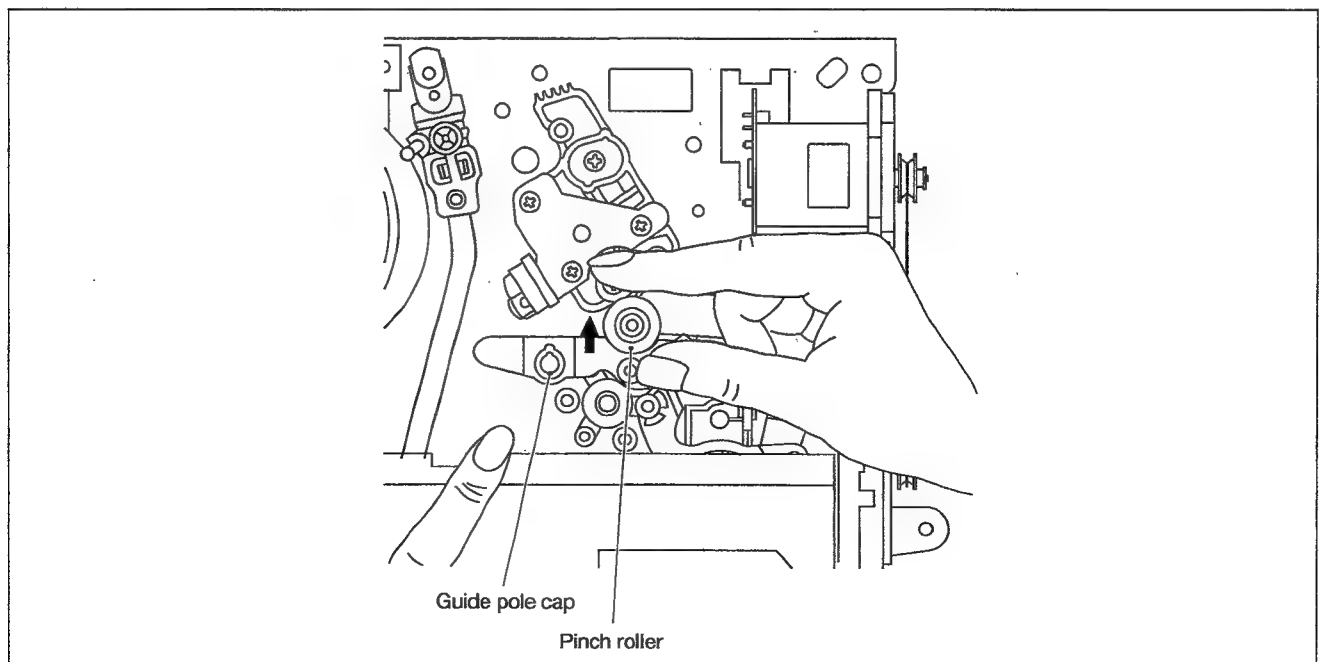


Fig. 2-1-4

2.1.4 Jigs and Tools Required for Adjustment

Alignment tape (SP) MHPE	Alignment tape (LP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	

Table 2-1-1 Jigs and tools required for adjustment

2.1.5 Maintenance and Inspection

1. Location of major mechanical parts

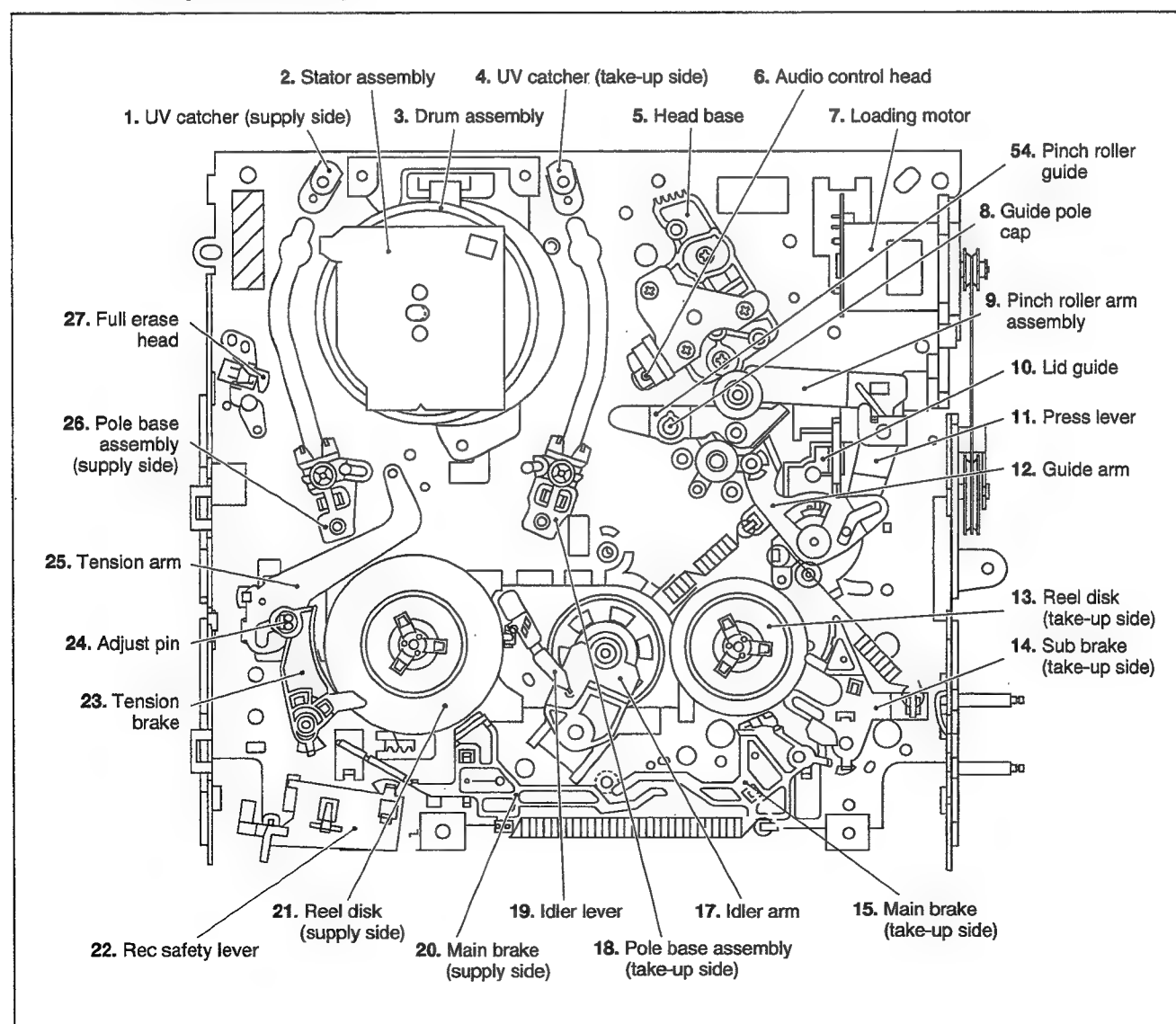


Fig. 2-1-5 Main deck top side

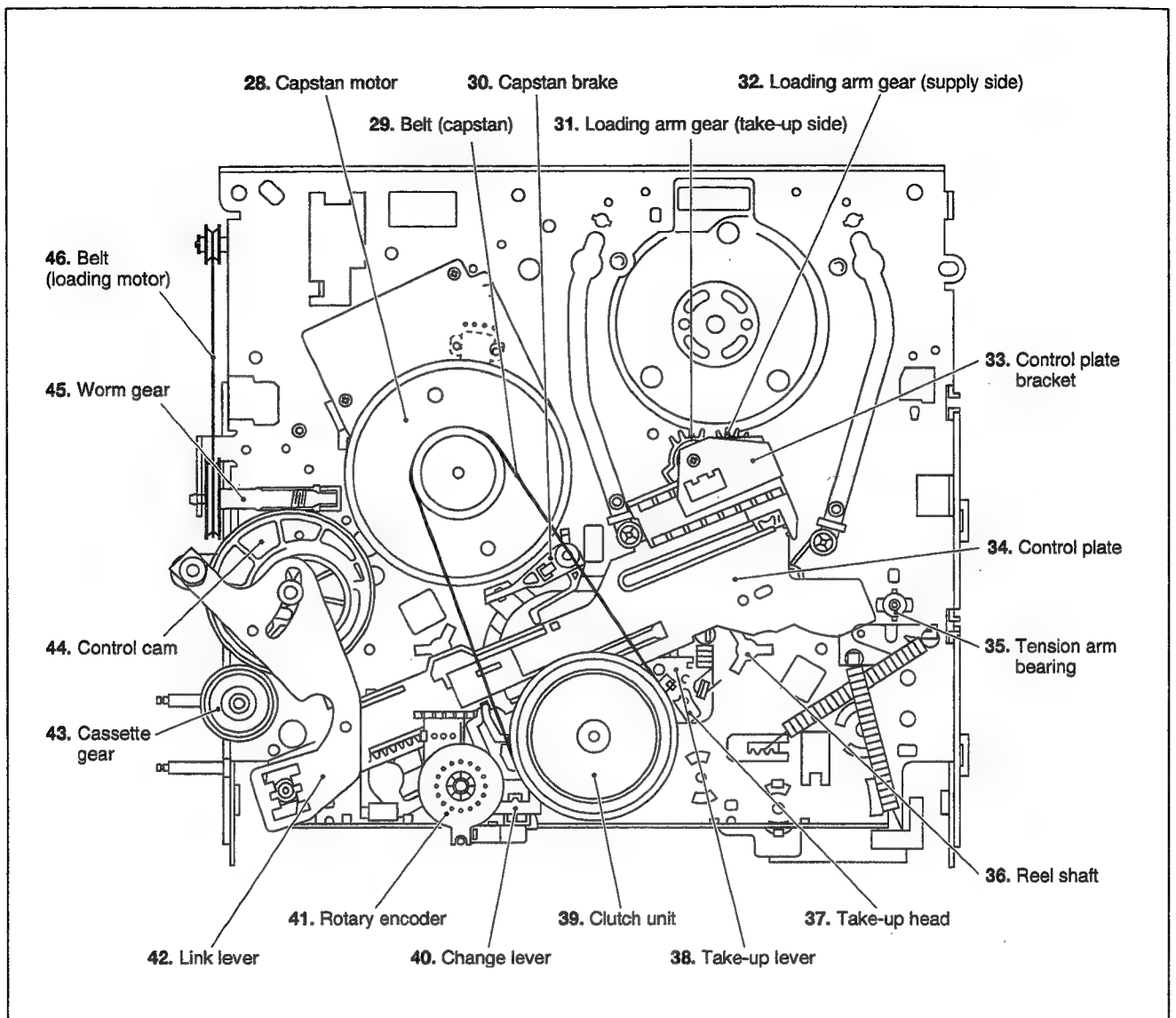


Fig. 2-1-6 Main deck bottom side

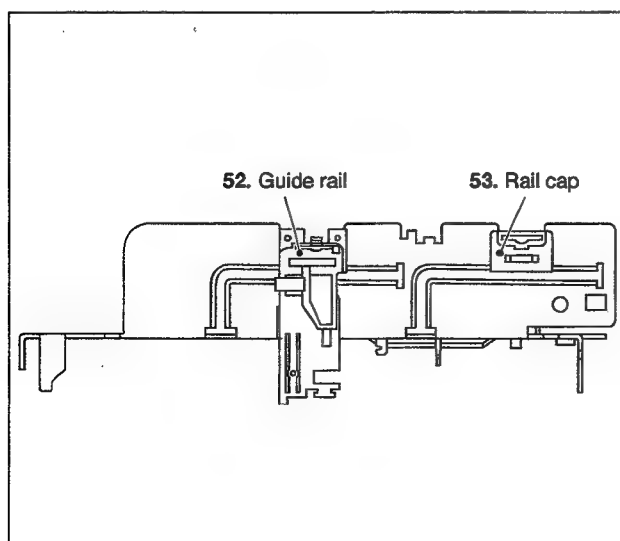


Fig. 2-1-7 Main deck left side

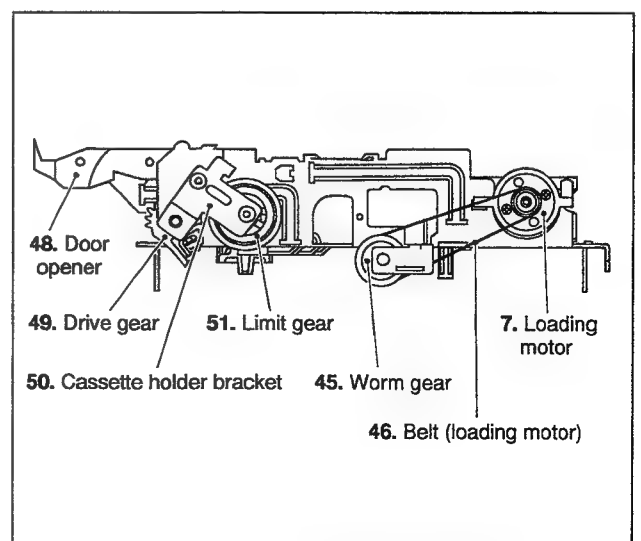


Fig. 2-1-8 Main deck right side

Note: Numerals at the start of the parts names are identical with those of the location diagrams of the major mechanical parts, 1 - 18 of which denote the order of removal. Of the alphabets T and B next to the parts names, T denotes removal from the main deck top side, B from the bottom side and T/B from both sides.

			1,4	12	53	46	9	52	11	50	-	-	-	49	32	-	-	38	25	23	31	21	42	41	29	39	40	33	34	14	19	54
	Removable parts names		UV catcher	Guide arm assembly	Rail cap	Belt (loading motor)	Pinch roller arm assembly	Guide rail	Press lever assembly	Cassette Holder bracket	Opener guide	Relay gear	Cassette holder assembly	Drive gear	Loading arm gear (supply side)	Drive arm assembly	Tension spring	Take-up lever	Tension arm assembly	Tension brake assembly	Loading arm gear (take-up side)	Reel base (supply side)	Link lever	Rotary encoder	Belt (capstan motor)	Clutch unit	Change lever	Control plate bracket	Control plate	Sub brake	Idler lever	Pinch roller guide
17	Idler arm	T			1			2		3	4	5	6	7	8					9		10	11	12	13	14	15	16	17		18	
15	Main brake (take-up side)	T/B			1			2		3	4	5	6	7	8								9	10	11	12	13	14	15	16		
13	Reel disk (take-up side)	T			1			2		3	4	5	6	7	8								9	10	11	12	13	14	15	16		
19	Idler lever	T/B			1			2		3	4	5	6	7	8					9		10	11	12	13	14	15	16	17			
-	Rotary encoder guide	T/B			1			2		3	4	5	6	7	8								9	10	11	12	13	14	15	16		
14	Sub brake (take-up side)	T/B			1			2		3	4	5	6	7	8								9	10	11	12	13	14	15			
-	Loading arm gear shaft	B													8						9	1	2	3	4	5	6	7				
35	Tension arm bearing	T			1			2		3	4	5	6				8		9	7												
-	Control plate guide	T/B															8						1	2	3	4	5	6	7			
37	Take-up head	B																8					1	2	3	4	5	6	7			
31	Loading arm gear (take-up side)	B													8								1	2	3	4	5	6	7			
25	Tension arm assembly	T/B			1			2		3	4	5	6				8			7												
20	Main brake (supply side)	T/B			1			2		3	4	5	6	7	8																	
38	Take-up lever	T/B																					1	2	3	4	5	6	7			
32	Loading arm gear (supply side)	B																					1	2	3	4	5	6	7			
21	Reel disk (supply side)	T			1			2		3	4	5	6	7																		
-	Drive arm assembly	T			1			2		3	4	5	6	7																		
30	Capstan brake	T/B																						1	2	3	4	5	6	7		
34	Control plate	B																						1	2	3	4	5	6			
23	Tension brake assembly	T/B			1			2		3	4	5	6																			
-	Cassette holder assembly	T			1			2		3	4	5																				
-	Direct gear	B																						1	2	3	4					
10	Lid guide	T		1				2	3																							
40	Change lever	B																						1	2	3						
49	Drive gear	T								1	2	3																				
11	Press lever assembly	T		1				2																								
-	Relay gear	T								1	2																					
51	Limit gear assembly	T								1	2																					
26	Pole base assembly (supply side)	T/B	1																													
18	Pole base assembly (take-up side)	T/B	1																													
-	Tension spring (Main brake)	T																														
22	Rec safety lever	T/B																														
28	Capstan motor	T/B																								1						2
45	Worm gear	B				1																										
44	Control cam	B																						1								
43	Cassette gear	B																						1								
39	Clutch unit	B																								1						
9	Pinch roller arm assembly	T		1																												
-	Opener guide	T								1																						
8	Guide pole cap	T																														
54	Pinch roller guide	T																														
1,4	UV catcher	T																														
42	Link lever	B																														
41	Rotary encoder	B																														
12	Guide arm assembly	T																														
50	Cassette holder bracket	T																														
52	Guide rail	T																														
53	Rail cap	T																														
7	Loading motor assembly	T																														
5	A/C head assembly	T																														

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

- (1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note: Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.

- (2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.
- (3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

- (1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the dis-assembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time, even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake		○
	Main brake		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear assembly		○
	Control plate		○
	Brush assembly	★○	★○
Other	Tension brake	○	○
	Rotary encoder		○

★: Cleaning

○: Inspection or Replacement if necessary

Table 2-1-3

2.2 REPLACEMENT OF MAJOR PARTS

2.2.1 Before Starting Disassembling

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.

This mode is usually not in use, manually set it when it is required.

2.2.2 How to Set the Mechanism Assembling Mode

Remove the main deck assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY). Turn the worm gear toward the front so that the register hole of the control cam is brought into alignment with the hole at the main deck assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1)

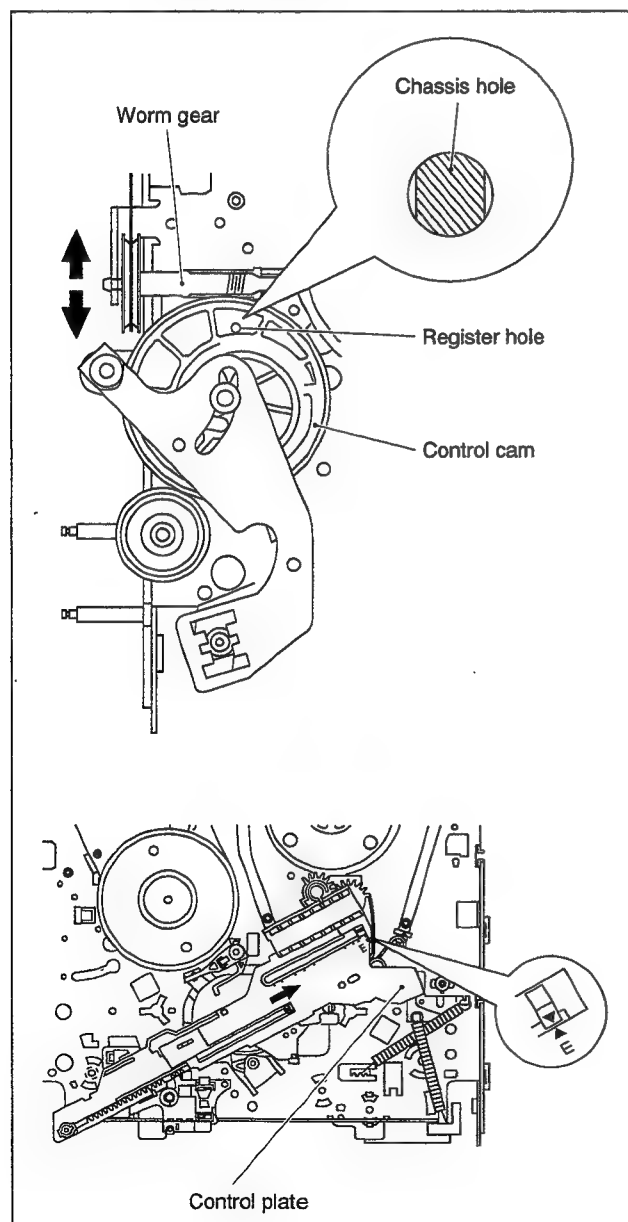


Fig. 2-2-1

2.2.3 Cassette Holder Assembly

1. How to remove

- (1) Remove the guide rail and rail cap. (See Fig.2-2-2).
(2 lugs on the guide rail and one lug on the rail cap)

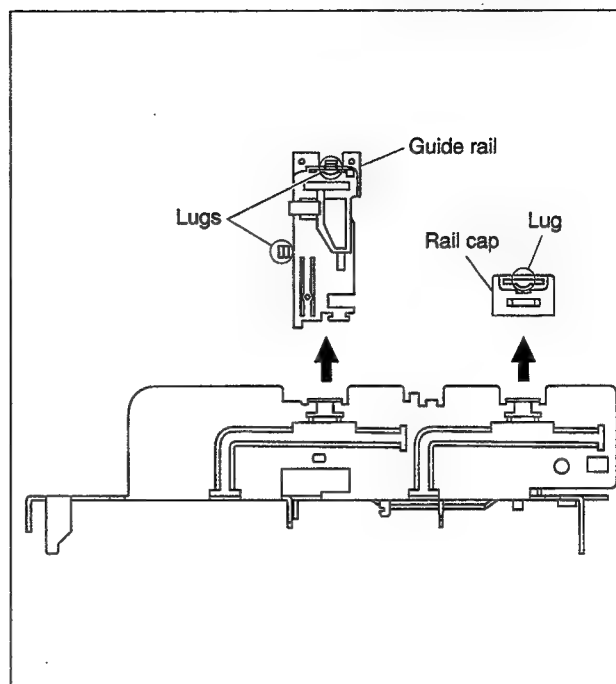


Fig. 2-2-2

- (2) Remove the two slit washers and remove the cassette holder bracket. (See Fig.2-2-3)
- (3) Remove the opener guide, relay gear and limit gear. (See Fig.2-2-3)

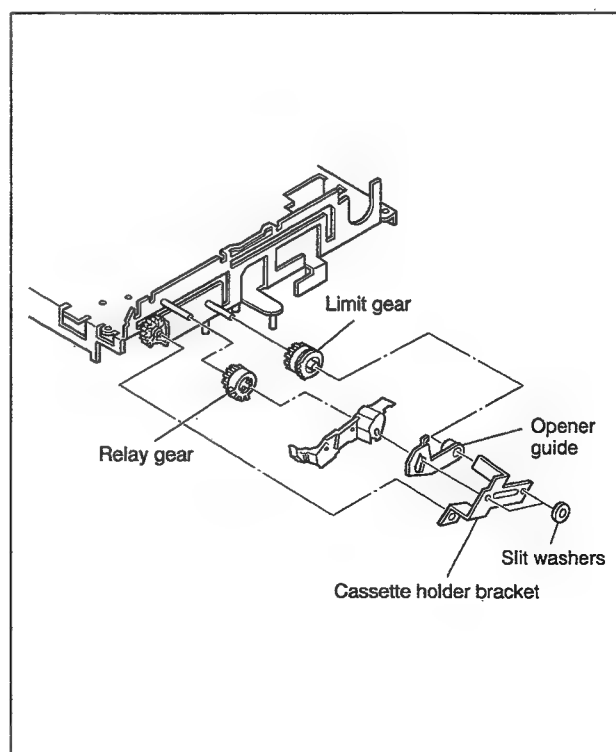


Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the rail cap have been removed (so that the drive arm is upright). (See Fig.2-2-4)

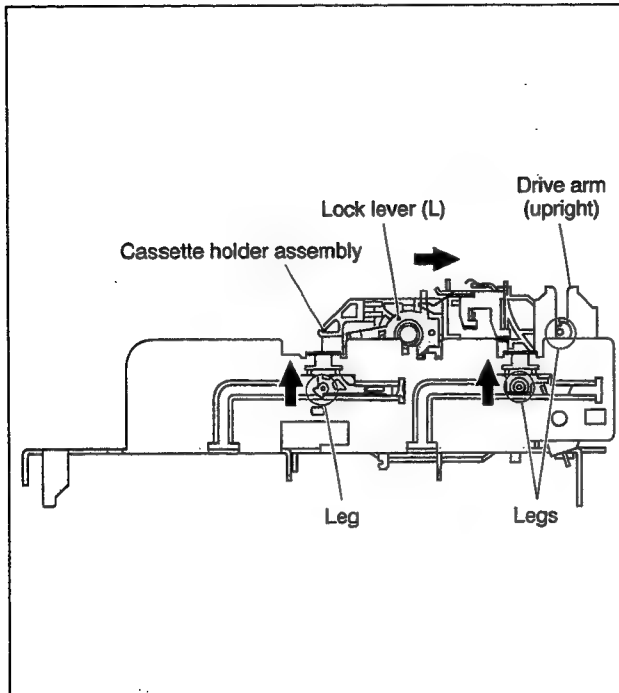


Fig. 2-2-4

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs (A) and (B) on the right side out of the rail and also pull up the leg (C). (See Fig.2-2-5, Fig.2-2-6)

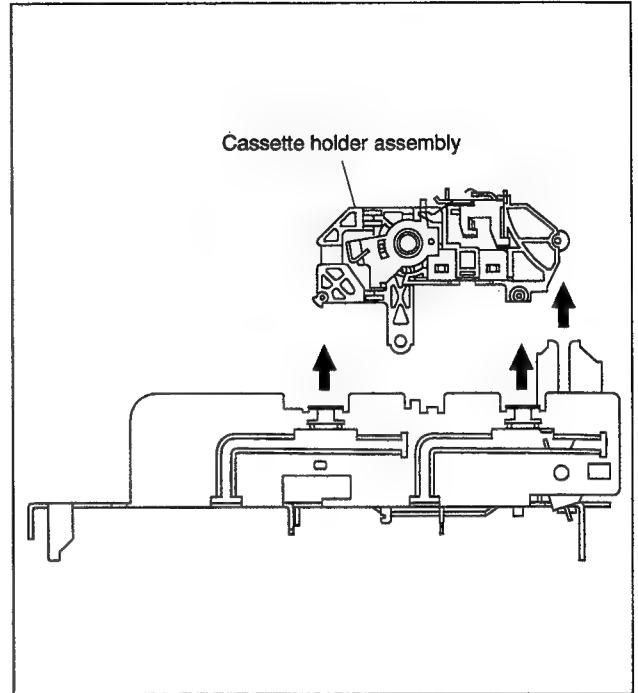


Fig. 2-2-5

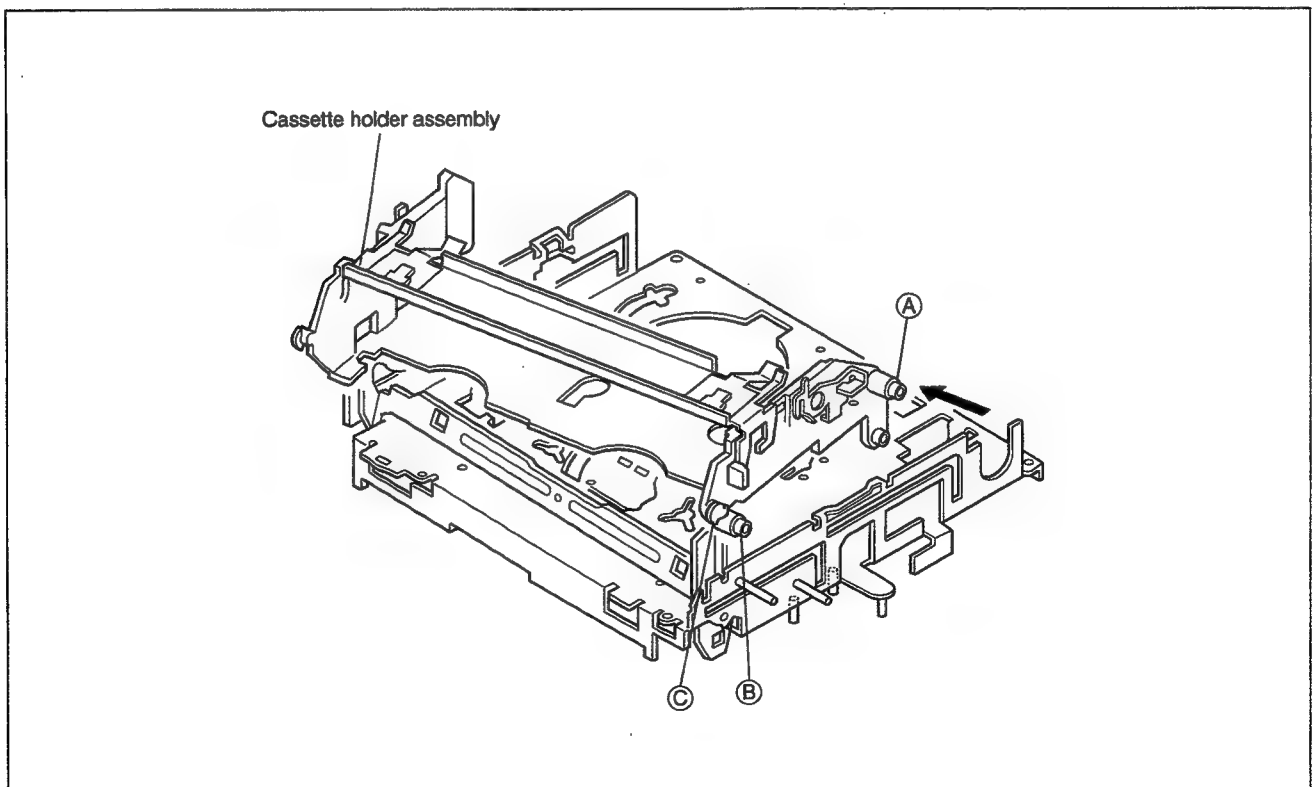


Fig. 2-2-6

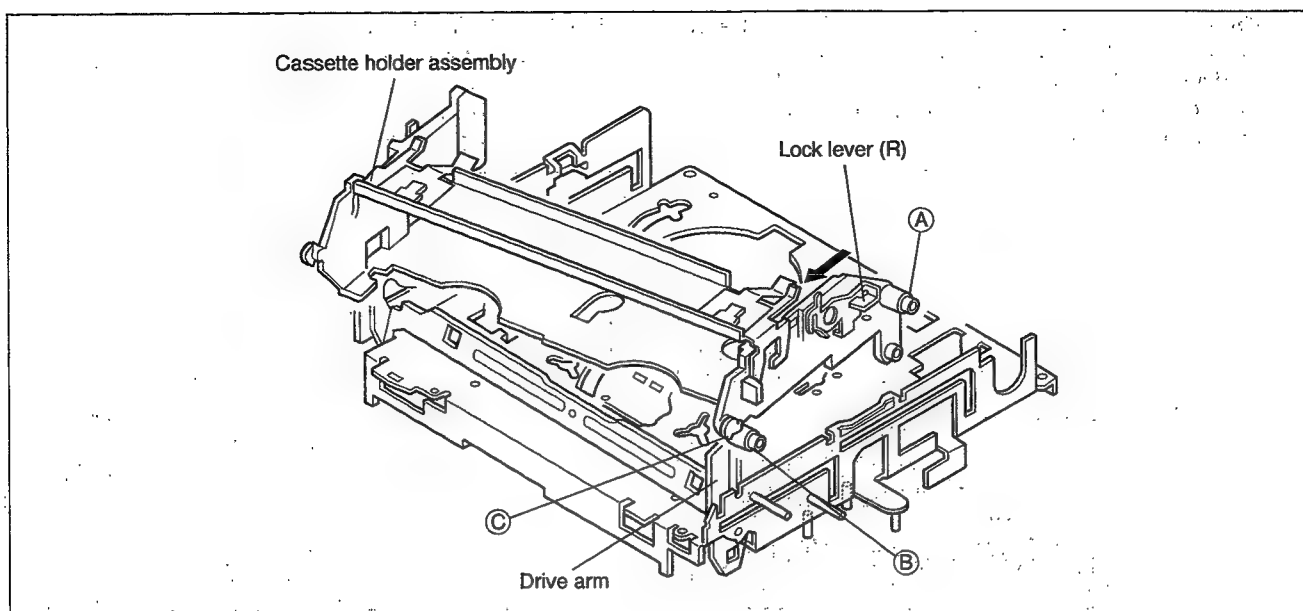


Fig. 2-2-7

2. How to install

- (1) Hold the drive arm upright and fit the leg © on the right side of the cassette holder assembly into the groove. (See Fig.2-2-7)
- (2) While swinging the lock lever (R) of the cassette holder assembly toward front, put the legs A and B into the rail. (See Fig.2-2-7)
- (3) Drop the three legs on the left side of the cassette holder into the groove at one time. (See Fig.2-2-8)
- (4) Slide the whole cassette holder toward the front to bring it to the eject end position.
- (5) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the register hole on the main deck. (See Fig.2-2-9)
- (6) Install the relay gear so that the notch on the outer circumference of the relay gear is brought into alignment with the notch on the main deck. It is important at this stage that the register hole at the limit gear, the register hole at the relay gear and the register hole at the drive gear are all in alignment. (See Fig.2-2-9).
- (7) Install the door stopper, opener guide and cassette holder bracket and fasten the two slit washers.

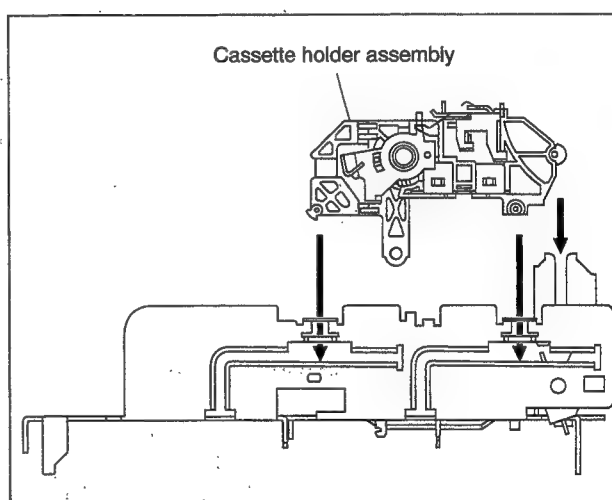


Fig. 2-2-8

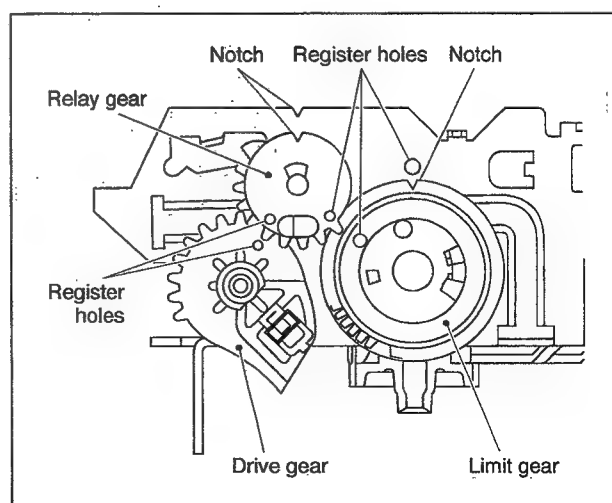


Fig. 2-2-9

2.2.4 Pinch Roller Arm Assembly

1. How to remove

- (1) Remove the spring from the hook of the press lever.
- (2) Remove the slit washer and remove the pinch roller seat. (See Fig.2-2-10)
- (3) Remove the pinch roller arm assembly by pulling it up.

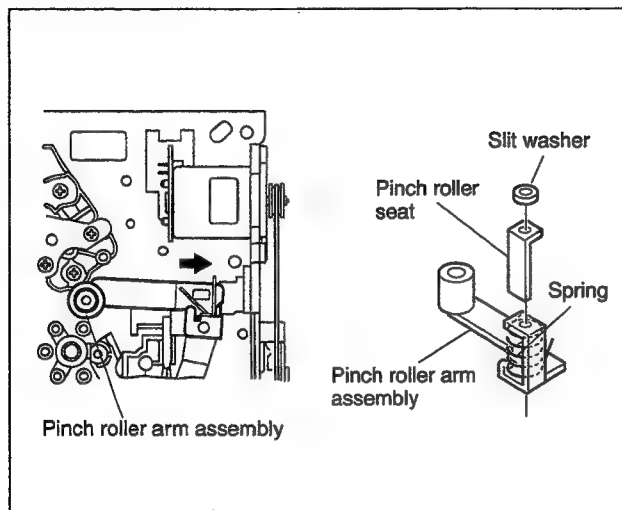


Fig. 2-2-10

2.2.5 Guide Arm and Press Lever

1. How to remove

- (1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm by pulling it up.
- (2) Remove the press lever by pulling it up. (See Fig.2-2-11)

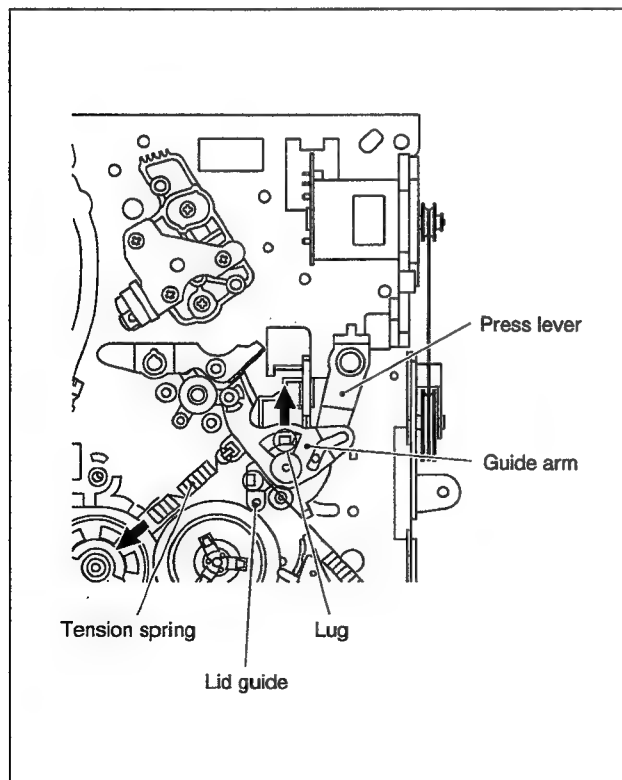


Fig. 2-2-11

2.2.6 Audio Control Head

1. How to remove

- (1) Remove two screws (A) and remove the audio control head together with the head base.

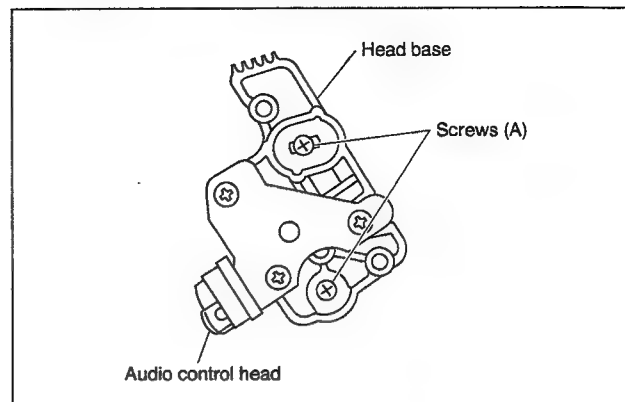


Fig. 2-2-12

- (2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

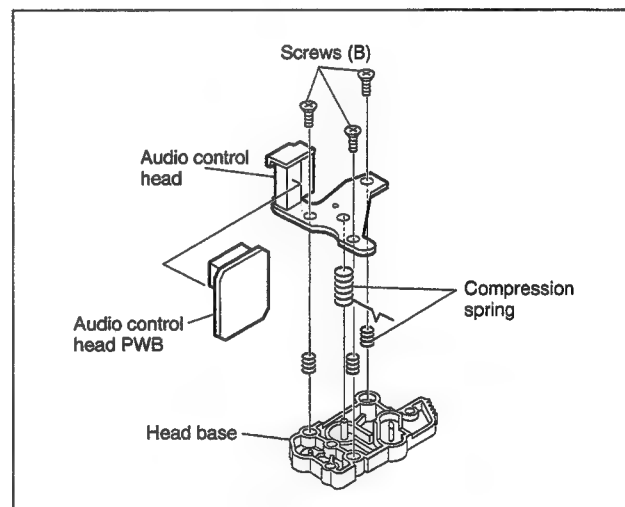


Fig. 2-2-13

2. How to install

- (1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-14. Also make sure that the screw center is brought into alignment with the center position of the slot.

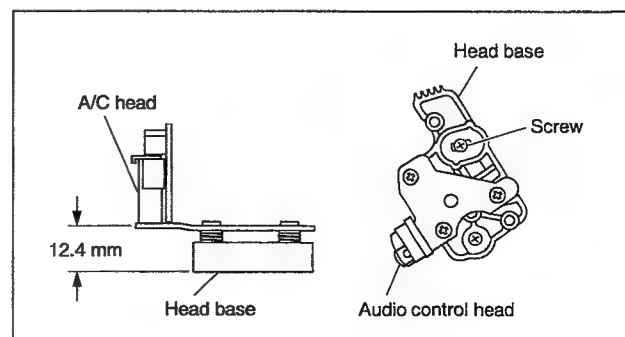


Fig. 2-2-14

2.2.7 Loading Motor

1. How to remove

- (1) Remove the belt wound around the worm gear.
- (2) Open the two lugs of the motor guide and remove the loading motor, loading motor PWB and motor guide altogether by pulling them up.
- (3) When replacing the motor base, take care with the orientation of the motor (so that the label faces upward).
- (4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-15.

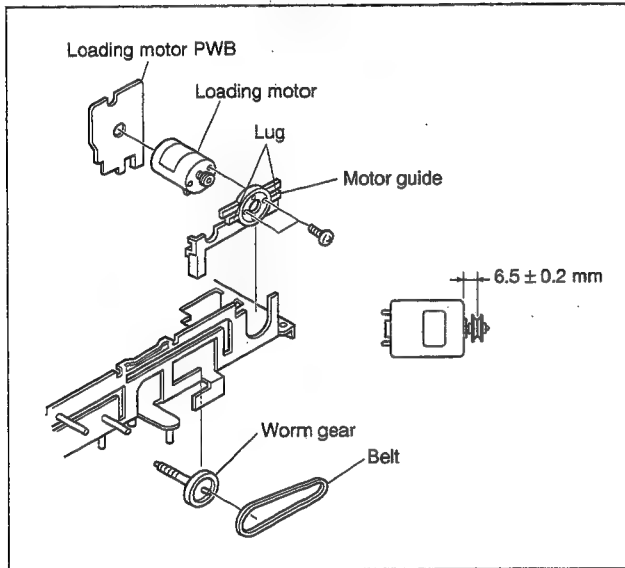


Fig. 2-2-15

2.2.8 Capstan Motor

1. How to remove

- (1) Remove the belt (capstan) on the main deck back side.
- (2) Remove one screw (A) and remove the pinch roller guide.
- (3) Remove two screws (B) and remove the capstan motor.

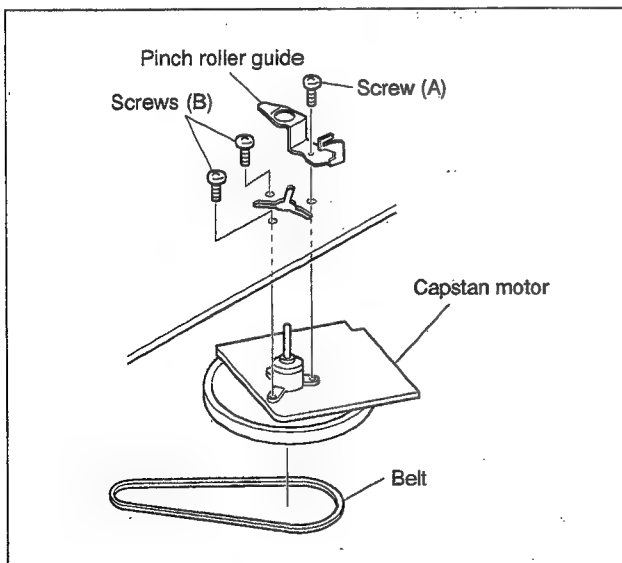


Fig. 2-2-16

2. How to install

Please refer to page 2-25.

2.2.9 Pole Base (on the supply or take-up side)

1. How to remove

- (1) Remove the UV catcher on the removal side by loosening one screw (A).
- (2) Remove the pole base on the supply side from the main deck by loosening one screw (B) on the main deck back side and sliding the pole base toward the UV catcher.
- (3) As for the pole base on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate (See the "Procedures for Lowering the Cassette holder assembly" on page 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD). Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing one screw (B).

NOTE: After reinstalling the Pole base and the UV catcher, be sure to perform compatibility adjustment.

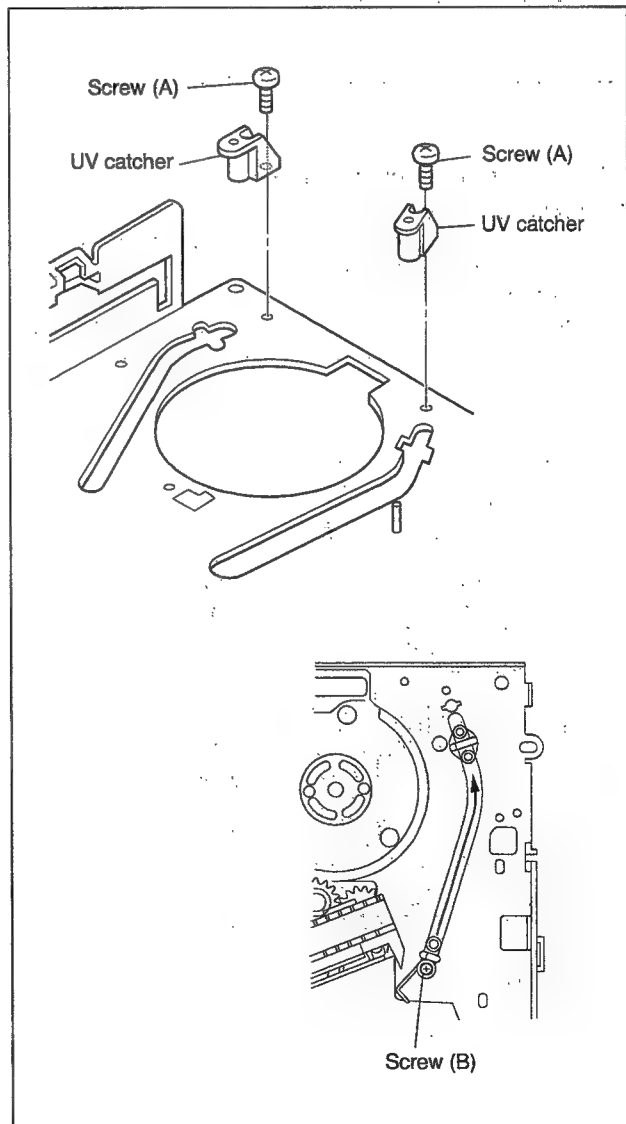


Fig. 2-2-17

2.2.10 Rotary Encoder

- (1) Remove one screw (A) and remove the rotary encoder by pulling it up.
- (2) When installing the rotary encoder, bring the register marks into alignment as indicated in Fig.2-2-18.

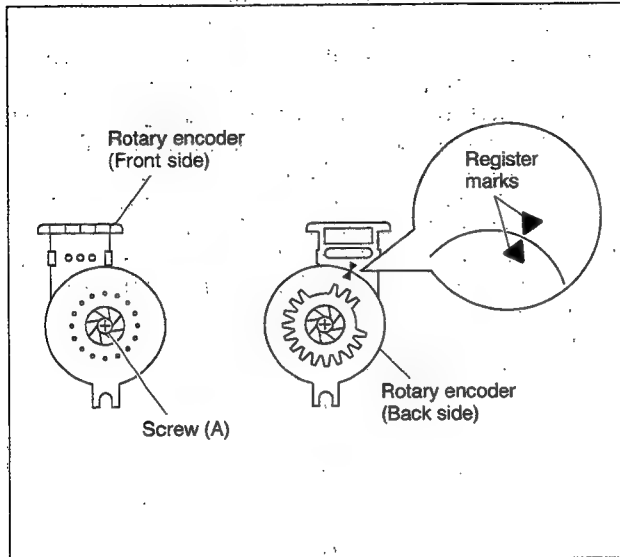


Fig. 2-2-18

2.2.11 Clutch Unit

- (1) Remove the belt wound around the capstan motor and the clutch unit.
- (2) Remove the slit washer and remove the clutch unit.

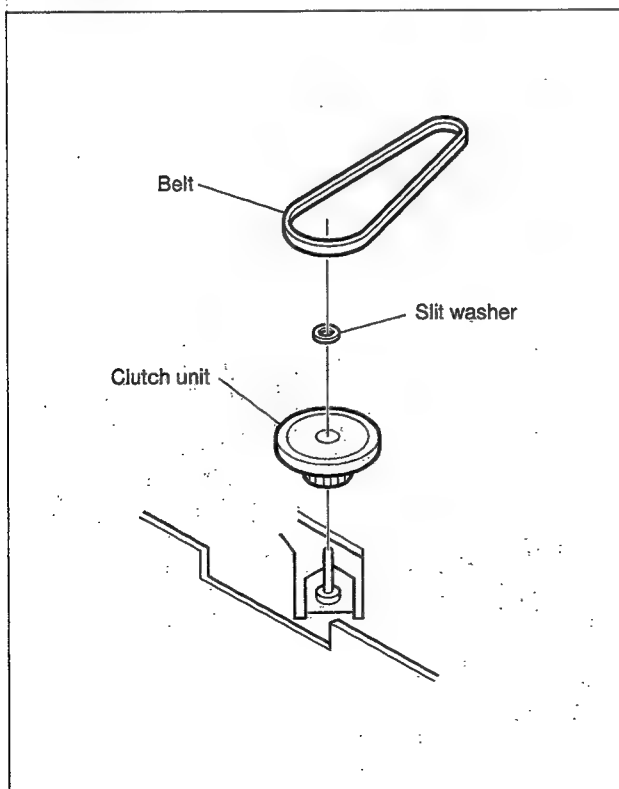


Fig. 2-2-19

2.2.12 Change Lever and Direct Gear

- (1) Release two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever.
 - (2) Remove the slit washer retaining the direct gear and remove the latter.
- Take care of the two washers and one spring on and under the direct gear. (See Fig.2-2-20)

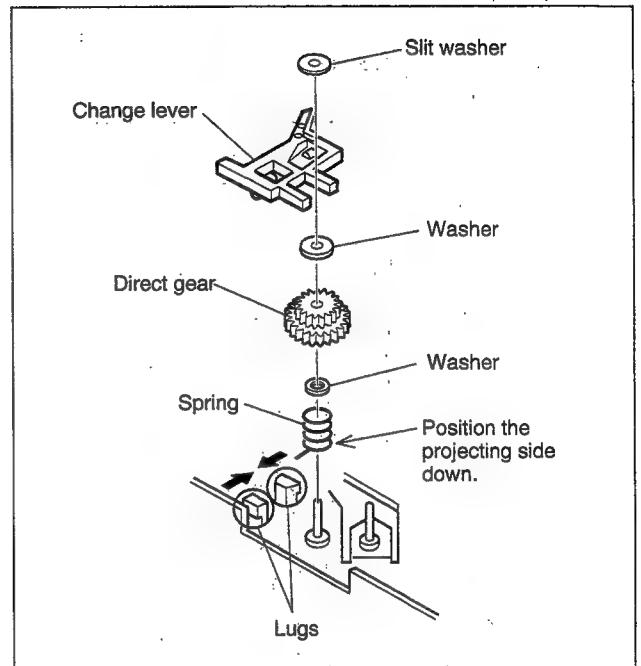


Fig. 2-2-20

2.2.13 Link Lever

- (1) Remove the two slit washers.
- (2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the lock member of the control plate.

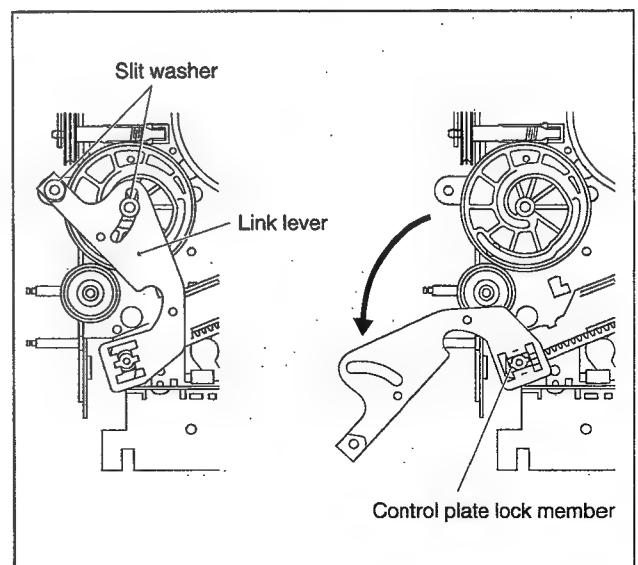


Fig. 2-2-21

2.2.14 Cassette Gear, Control Cam and Worm Gear

- (1) Remove the control cam by lifting it.
- (2) Open the two lugs of the cassette gear outward and pull the latter off.
- (3) Remove the belt wound around the worm gear and the loading motor.
- (4) Open the lug of the lid guide outward and remove the worm gear.
- (5) When installing the control cam, make sure that the register hole at the control cam is in alignment with the register hole of the main deck. (See Fig.2-2-22)

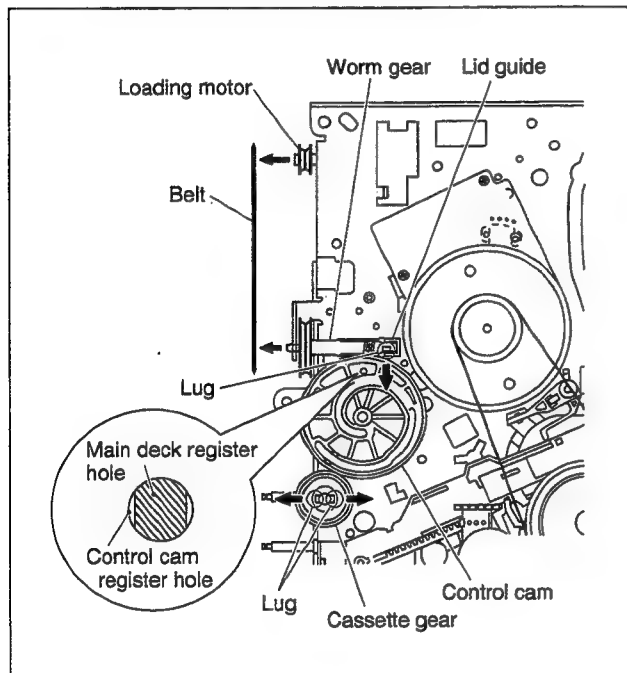


Fig. 2-2-22

2. How to install

- (1) Adjust the position of the idler arm pin as indicated in Fig.2-2-24. (to the left of center of the R section)
- (2) Bring the positioning hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.
- (3) Press-fit the pole base (on the supply side) as indicated by the arrow and install the control plate so that section A of the loading arm gear shaft fits into hole (A) of the control plate, section B of the control plate guide into hole (B), and the control plate comes under section C of the rotary encoder guide and section D of the loading arm (on the take-up side). Then slide the whole control plate in the arrow-indicated direction. (See Fig.2-2-25).
- (4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-25)
- (5) Pull off the hexagonal wrench for positioning.

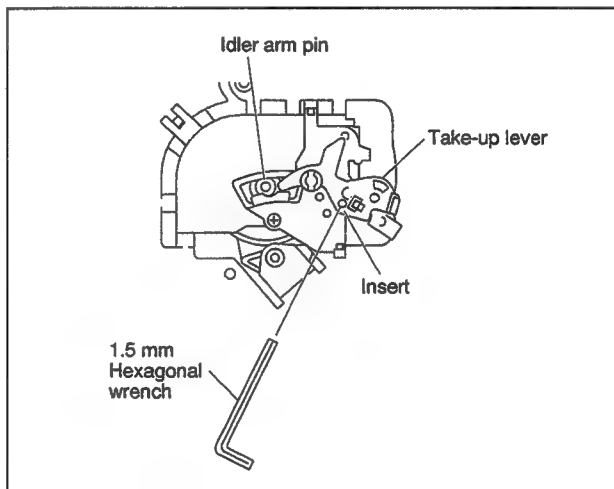


Fig. 2-2-24

2.2.15 Control Plate

1. How to remove

- (1) Remove one screw (A) retaining the control plate bracket and remove the latter.
- (2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-23)

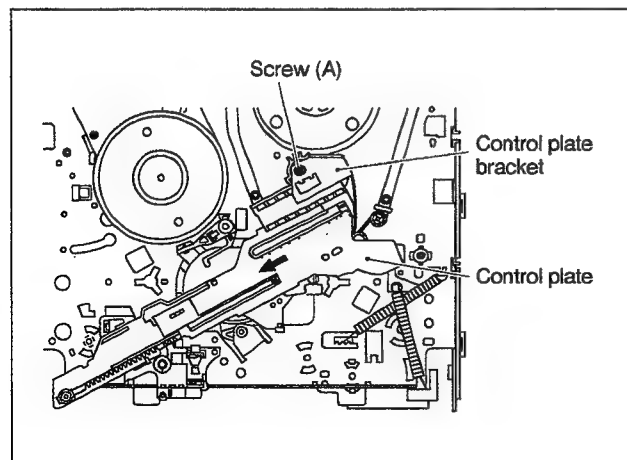


Fig. 2-2-23

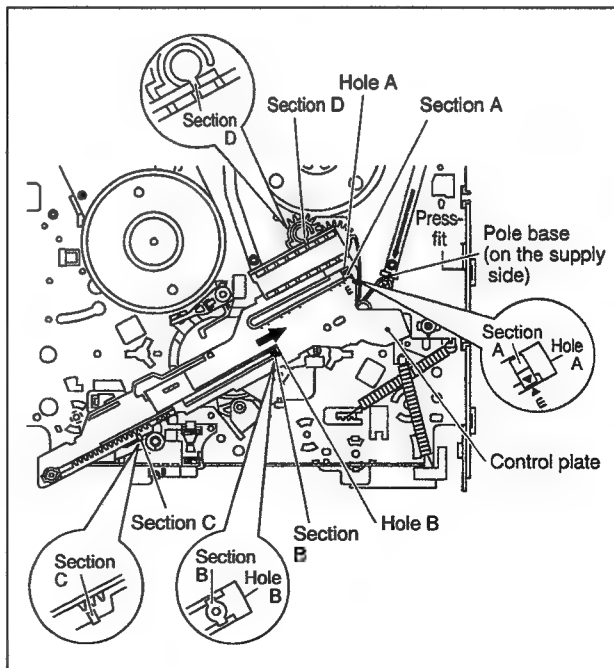


Fig. 2-2-25

2.2.16 Loading Arm (on the supply or take-up side) and Loading Arm Gear Shaft

1. How to remove

- (1) Remove the loading arm (on the supply side) by loosening screw (A) in Fig.2-2-26.
- (2) Remove screw (B) in Fig.2-2-26 and slide the pole base in the loading direction with the spring held on the pole base (on the take-up side). (See Fig.2-2-26)
- (3) Pull the spring out of the pole base. Turn the loading arm clockwise through about 45 degrees so that the notch of the loading arm is in alignment with the projection of the loading arm gear shaft and lift it. Likewise, turn the loading arm counterclockwise through 180 degrees so that the notch is in alignment with the projection and remove the loading arm (on the take-up side). (See Fig.2-2-27)
- (4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove one screw (C) and remove the loading arm gear shaft by sliding it in the arrow-indicated direction.

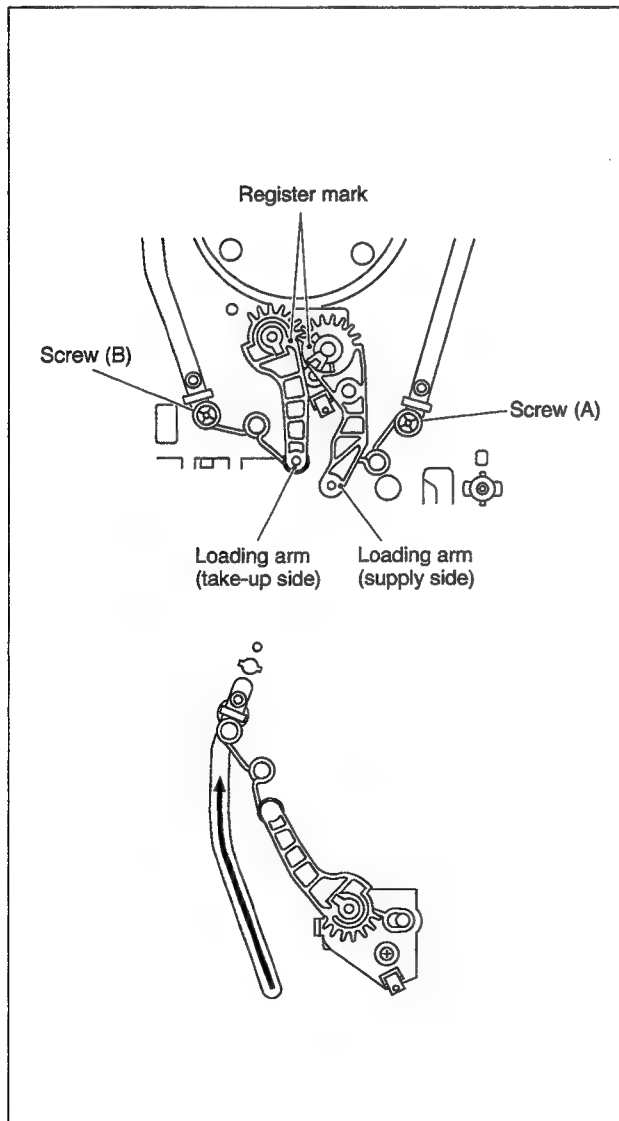


Fig. 2-2-26

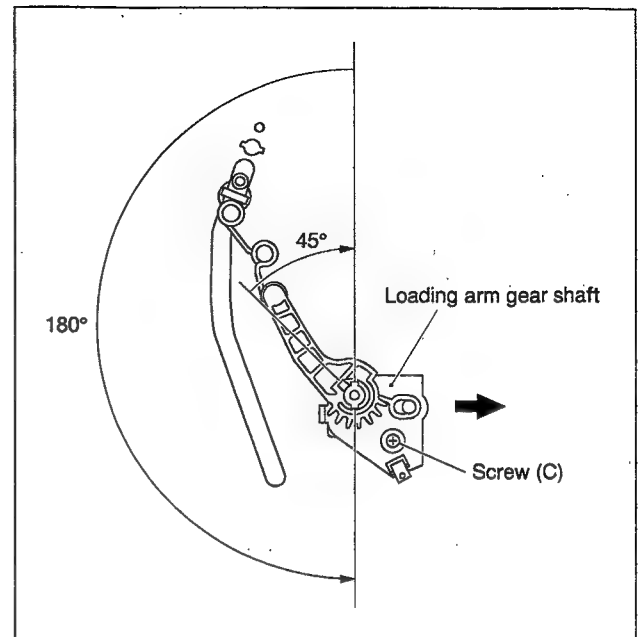


Fig. 2-2-27

2. How to install

- (1) Install the loading arm (on the take-up side) as indicated in Fig.2-2-28 and turn it clockwise through 180 degrees so that the loading arm reaches the bottom of the loading arm gear shaft.
- (2) Then turn the loading arm (on the take-up side) counterclockwise through 180 degrees. Hang the spring on the pole base and tighten the screw.
- (3) Install the loading arm (on the supply side) so that the register mark of the loading arm (on the take-up side) is in alignment with the register mark of the loading arm (on the supply side). Then hang the spring on the pole base and tighten the screw. (See Fig.2-2-26).

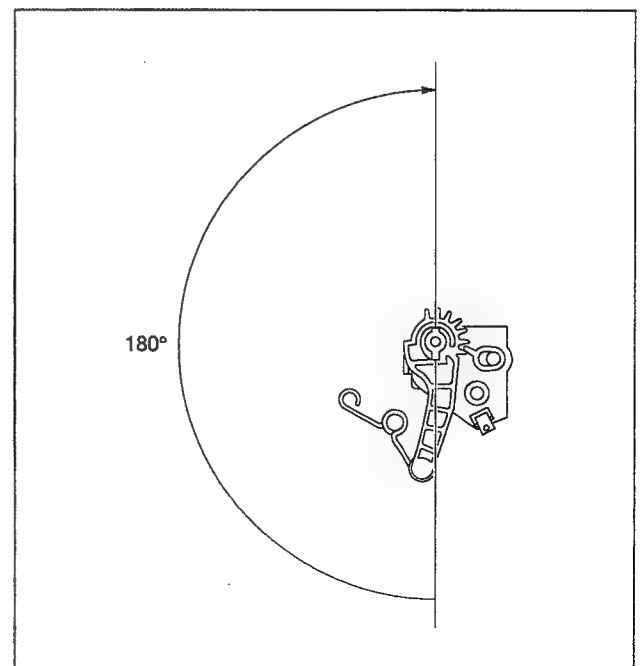


Fig. 2-2-28

2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

- (1) Remove the spring of the take-up lever from the main deck.
- (2) Remove one lug of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.
- (3) Remove one screw (A).
- (4) Remove two lugs of the control plate guide from the main deck. Locate the idler arm pin in the center of the R section of the control plate and remove the latter.

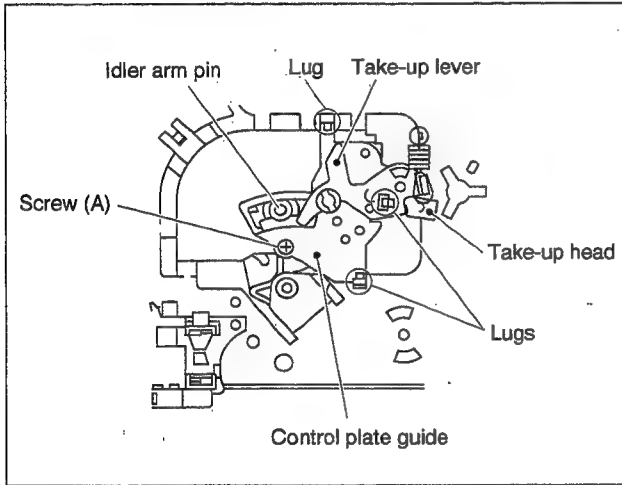


Fig. 2-2-29

2.2.18 Capstan Brake

- (1) Move lug A of the capstan brake in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-30)
- (2) Remove lug B of the capstan brake from the main deck and remove the capstan brake.

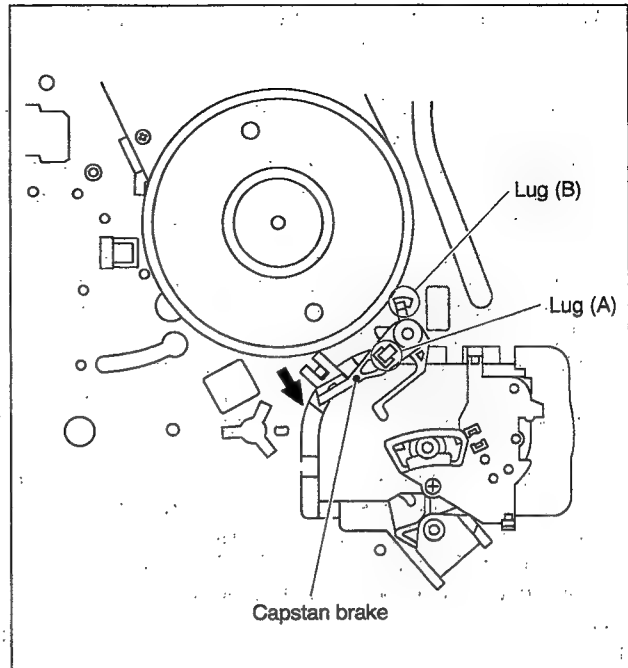


Fig. 2-2-30

2.2.19 Drive Gear and Drive Arm

1. How to remove

- (1) Remove the cassette holder assembly. (See 2.2.3 How to remove the cassette holder assembly)
- (2) Pull out the drive gear and remove the drive arm.

2. How to install

- (1) Insert section A of the drive arm into section B of the main deck.
- (2) Insert section ① of drive gear into hole ○ of the drive arm and section ② into hole □. (See Fig. 2-2-31)

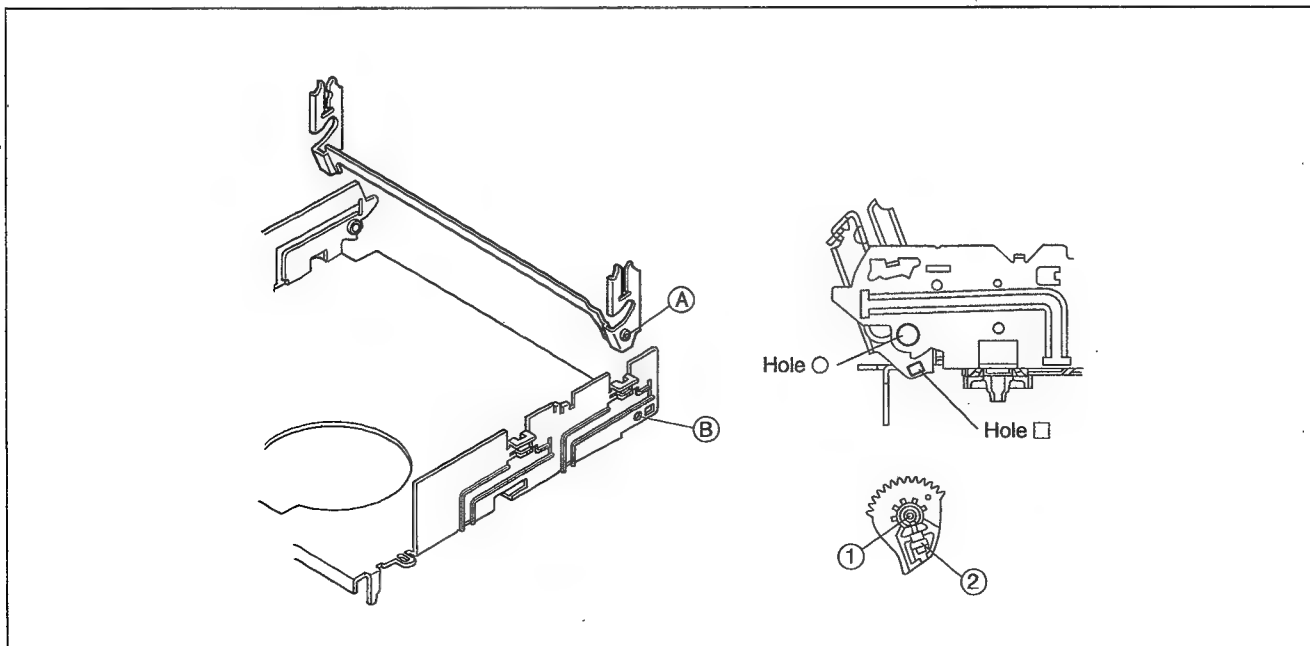


Fig. 2-2-31

2.2.20 Sub Brake (on the take-up side)

- (1) Remove the spring attached to the lid guide and sub brake.
- (2) Bring lug (A) of the sub brake into alignment with the notch of the main deck.
- (3) Remove lugs (B) and (C) of the sub brake from the main deck and remove the sub brake.

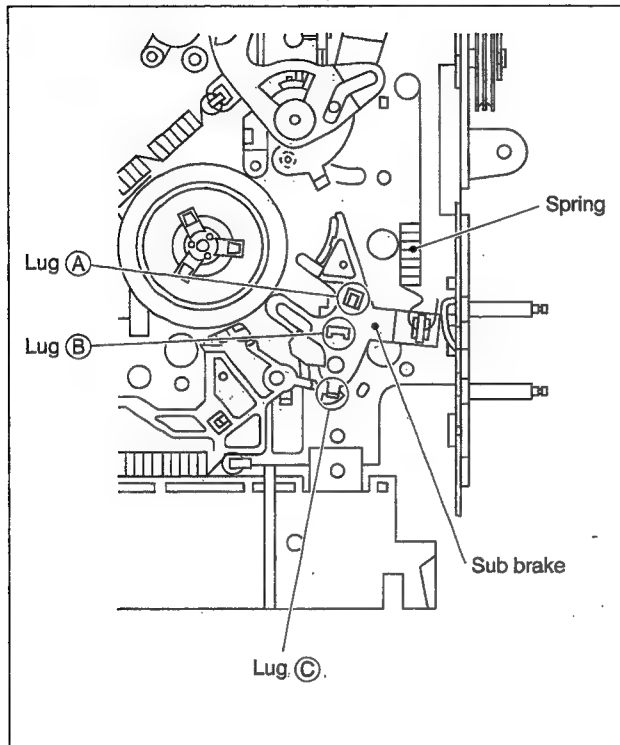


Fig. 2-2-32

2.2.21 Main Brake (on the take-up side), Reel Disk (on the take-up side) and Main Brake (on the supply side)

- (1) Move the main brake (on the take-up side) in the arrow-indicated direction and remove the reel disk (on the take-up side).
- (2) Remove the spring attached to the main brake.
- (3) Remove lug (A) of the main brake (on the take-up side) and pull out lug (B) after bringing it into alignment with the main deck notch.
- (4) Remove lugs (C) and (D) of the main brake (on the supply side) from the main deck and pull them off. (See Fig. 2-2-33)

Note: If the main brake is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it. After the adjustment pin has been removed or the main brake or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake torque. See page 2-24 for the detailed adjustment procedures.

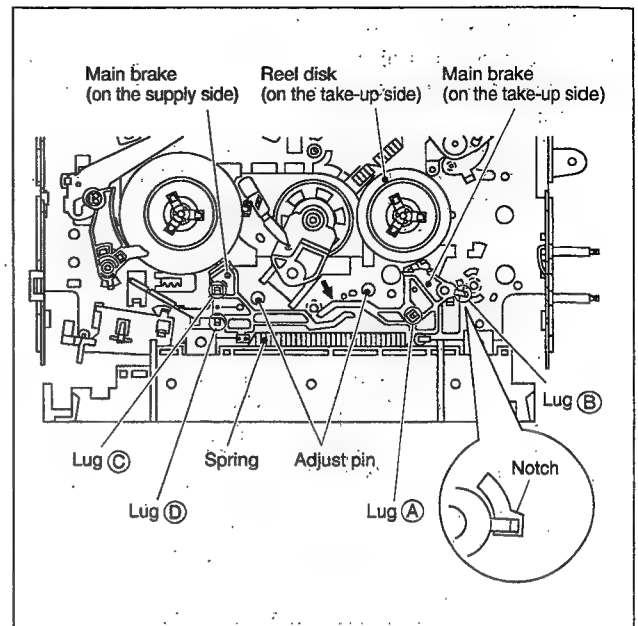


Fig. 2-2-33

2.2.22 Tension Brake, Reel Disk (on the supply side) and Tension Arm

- (1) Remove the three lugs of the tension brake from the main deck and pull them off.
- (2) Remove the reel disk (on the supply side) by loosening in the arrow-indicated direction the main brake (on the supply side).
- (3) Remove the tension spring on the main deck back side and remove the lugs of the tension arm bearing to pull up and remove the tension arm. (See Fig. 2-2-34)

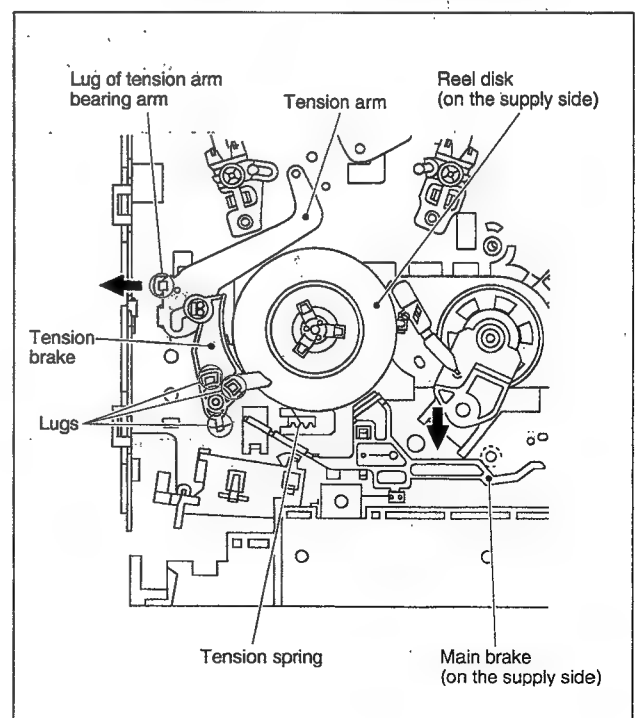


Fig. 2-2-34

2.2.23 Idler Lever, Idler Arm and Reel Shaft

- (1) Remove one lug of the idler lever from the main deck and remove the hook fitted in the idler arm hole by lifting it.
- (2) Remove the slit washer and pull out the idler arm.
- (3) Turn the reel shaft counterclockwise through 60 degrees and remove it. (See Fig.2-2-35)

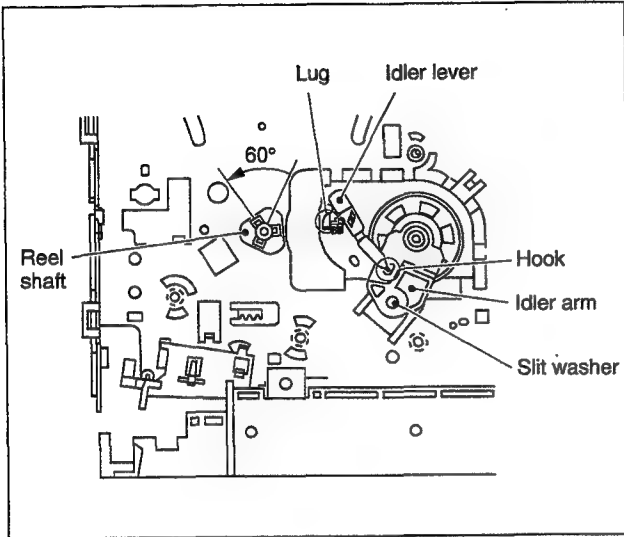


Fig. 2-2-35

2.2.24 Stator Assembly

- (1) Remove two screws (A).
- (2) Remove the stator assembly by lifting in the arrow-indicated direction (Take care that the brush spring does not jump out).
- (3) Remove the flat cable.
- (4) After installation, be sure to perform the 3.2.1 PB switching point adjustment according to the electrical adjustment procedure.

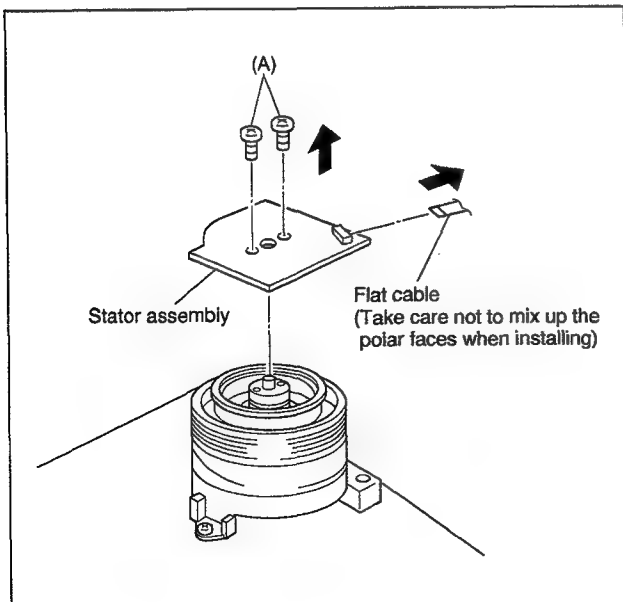


Fig. 2-2-36

2.2.25 Rotor Assembly

- (1) Remove the stator assembly.
- (2) Remove the two screws (B) and remove the rotor assembly.

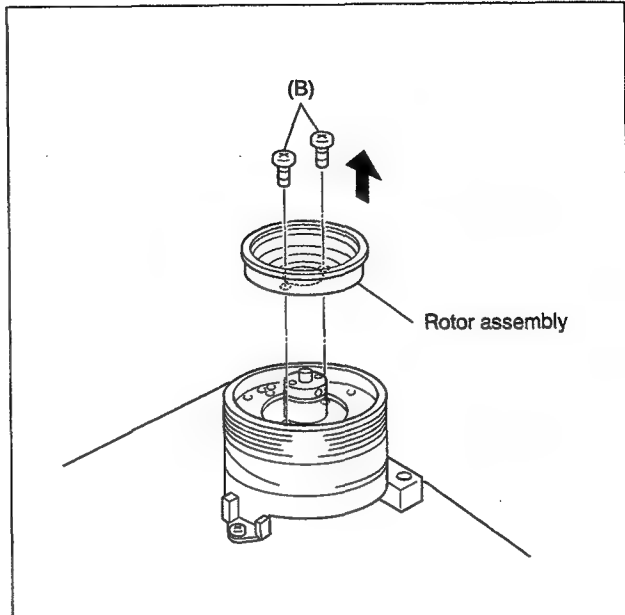


Fig. 2-2-37

Note: When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.

- (3) Match the phases of the upper drum and the rotor assembly as indicated in Fig.2-2-38.
- (4) Place the upper drum hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-38)

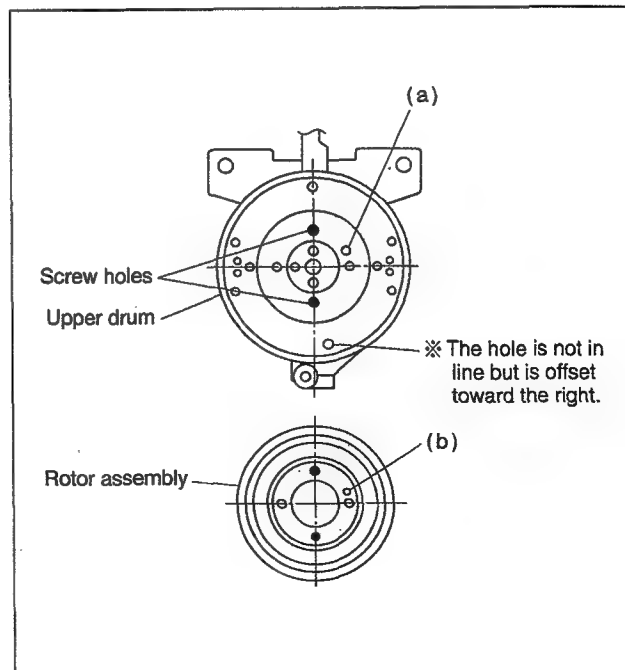


Fig. 2-2-38

2.2.26 Upper Drum Assembly

1. How to remove

- (1) Remove the stator assembly and rotor assembly. (See Fig. 2-2-36 and 2-2-37)
- (2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
- (3) Remove the upper drum assembly and remove the washer using tweezers.

Note: When replacement is required, control the up-down movement of the brush. Never apply grease.

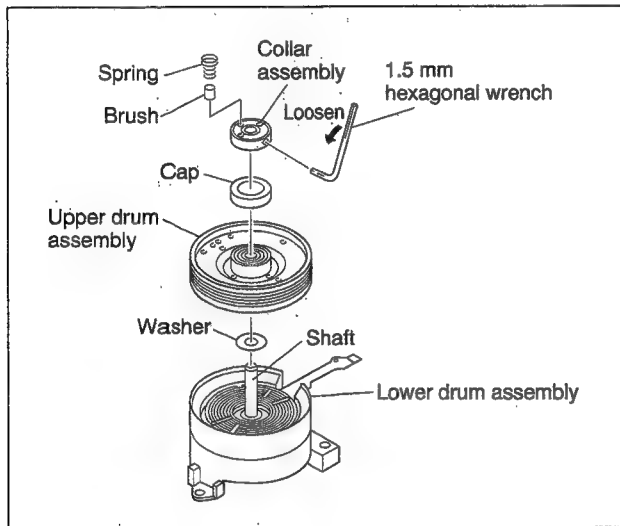


Fig. 2-2-39 Upper drum assembly-1

2. How to install

- (1) Clean coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-40).
- (2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-39)

Note: When replacing the upper drum assembly, replace it together with the washer.

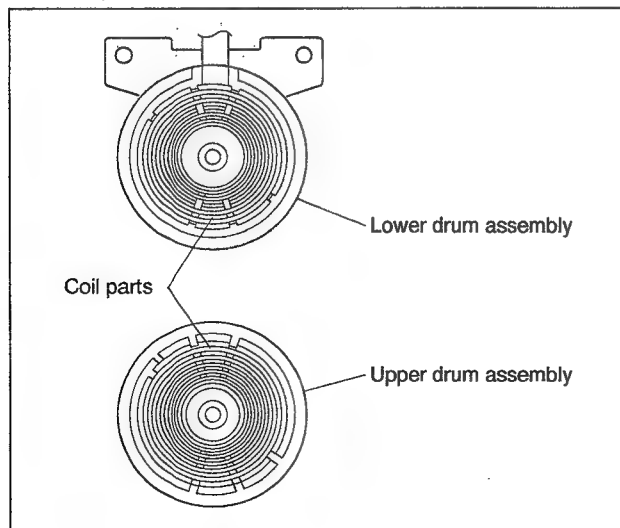


Fig. 2-2-40

- (3) Position the collar assembly as indicated in Fig.2-41 while controlling its up-down movement.

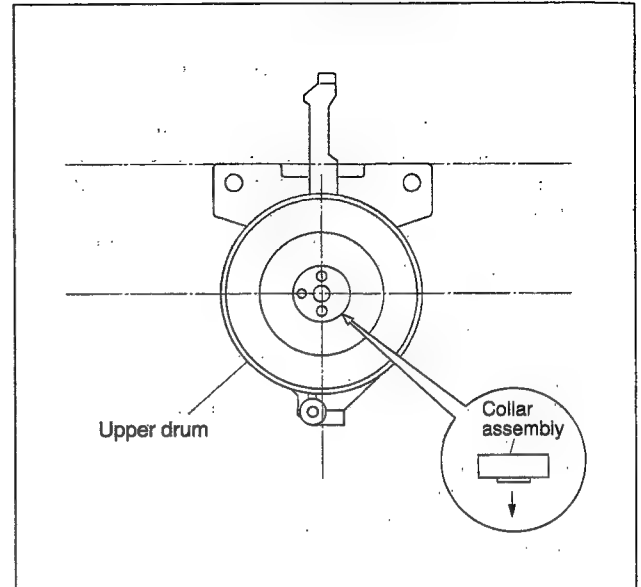


Fig. 2-2-41

- (4) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

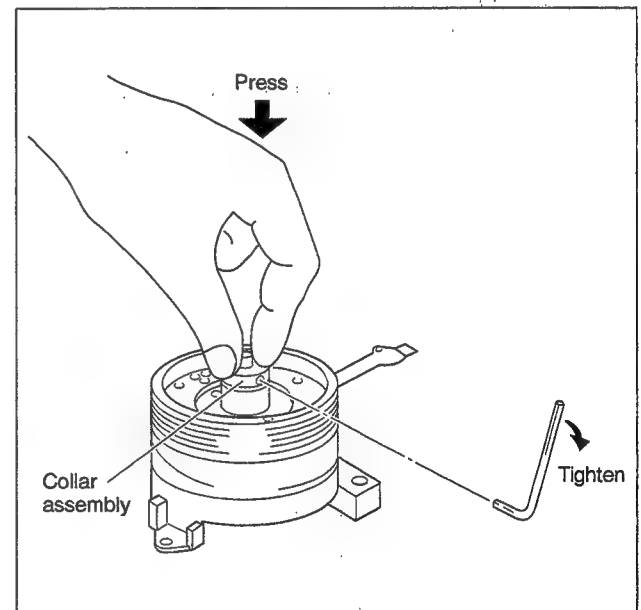


Fig. 2-2-42

- (5) After installation, gently turn the upper drum with your hand to make sure that it turns normally.
- (6) Install the rotor assembly and stator assembly according to Fig. 2-2-36 and 2-2-38.
- (7) When installation is complete, clean the upper drum assembly and lower the drum assembly and carry out the following adjustments.
 - PB switching point adjustment
 - Slow tracking adjustment
 - Compatibility adjustment (Be sure to check for compatibility for the EP mode.)

2.3 MAJOR PARTS INSTALLATION (PHASE MATCHING BETWEEN MECHANICAL PARTS)

2.3.1 Before Assembly of the Parts

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.

Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm assembly, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.

Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another. Perform the installation of major parts (including phase matching) in the mechanism assembling mode as in the previous section.

2.3.2 Loading Arm Assembly (on the Supply or Take-up Side)

- (1) Return the pole base assembly to the foremost position in the unloading direction.
 - (2) Install the loading arm assembly so that the register mark on the gear of the supply side loading arm is in alignment with the one on the take-up side loading arm as indicated in Fig. 2-3-1.
- See 2.2.16 "2. How to install" of the foregoing section for details of installation.

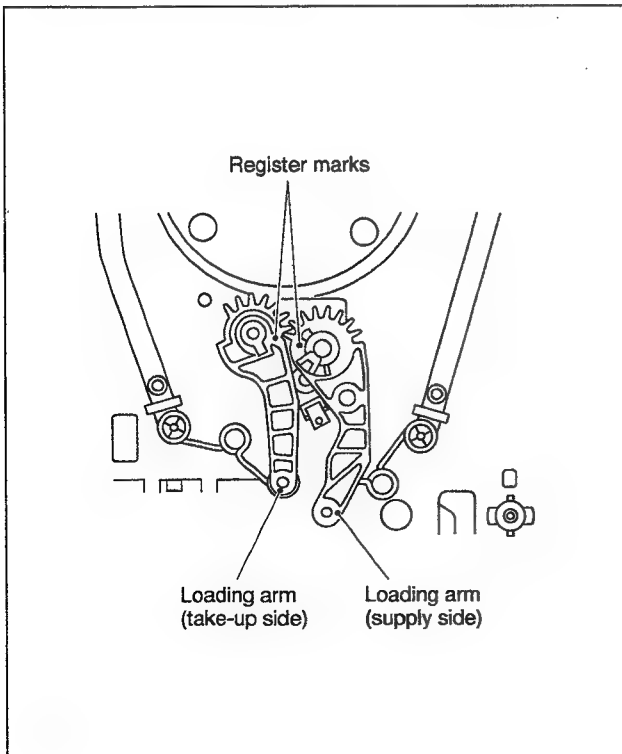


Fig. 2-3-1

2.3.3 Control Plate

- (1) With register marks on the both loading arm assemblies in alignment, install the control plate so that the mark ▼ on the loading arm gear shaft is in alignment with mark E of the control plate. (See Fig.2-3-2)
- See 2.2.15 "2. How to install" of the foregoing section for details of installation.

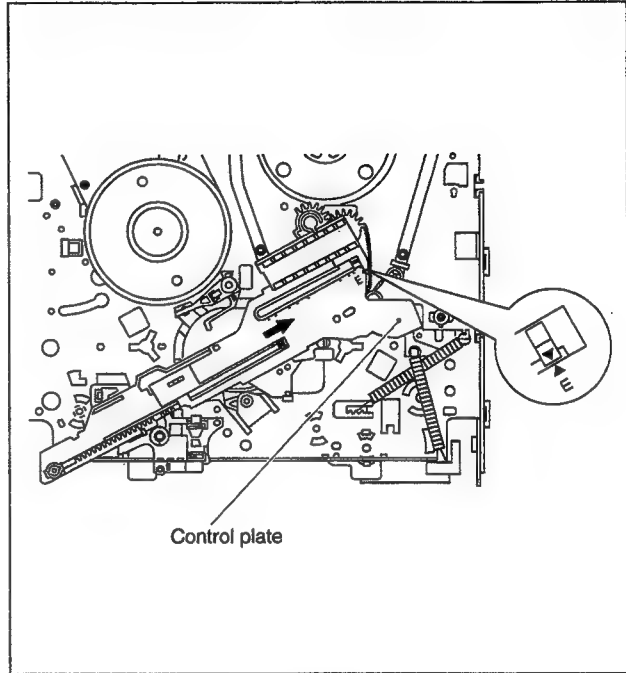


Fig. 2-3-2

2.3.4 Rotary Encoder

- (1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the register marks on the rotary encoder into alignment as indicated in Fig.2-3-3.
- (2) Turn over the rotary encoder with its register marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.
- (3) Tighten the screw (A) to complete the installation.

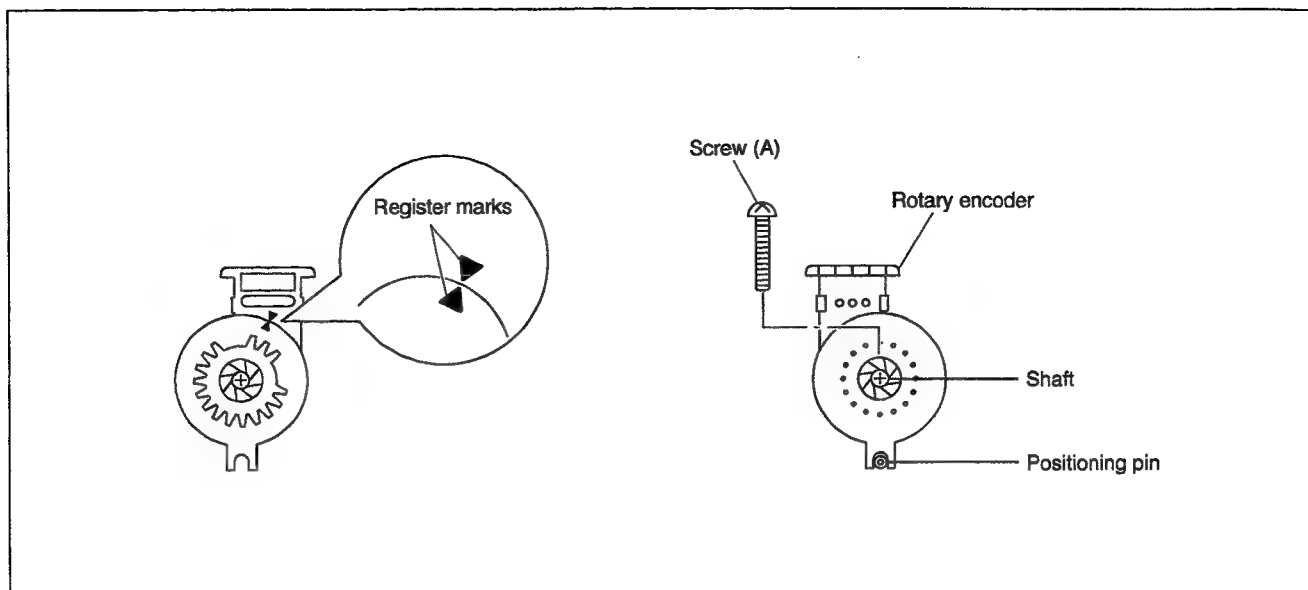


Fig. 2-3-3

2.3.5 Control Cam, Cassette Gear and Link Lever

- (1) Install the control cam as indicated in Fig.2-3-4 making sure of the front and back side alignment.
Note here that the register hole of the control cam is in alignment with and allows passage through the register hole of the main deck. Perform fine-adjustment by turning the worm gear.
- (2) Install the cassette gear by pushing it until it is locked with a clicking sound. (See Fig.2-3-4)
- (3) Insert section (A) of the link lever into section (B) of the control plate as shown in Fig.2-3-5.

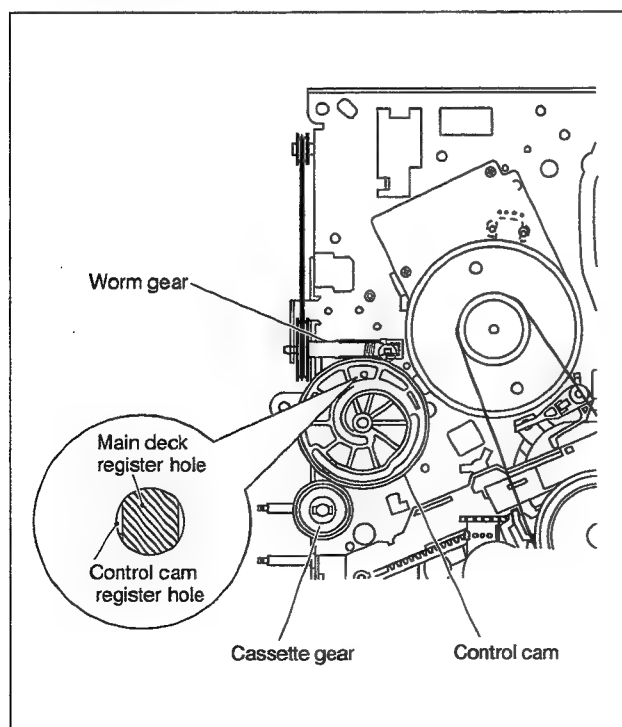


Fig. 2-3-4

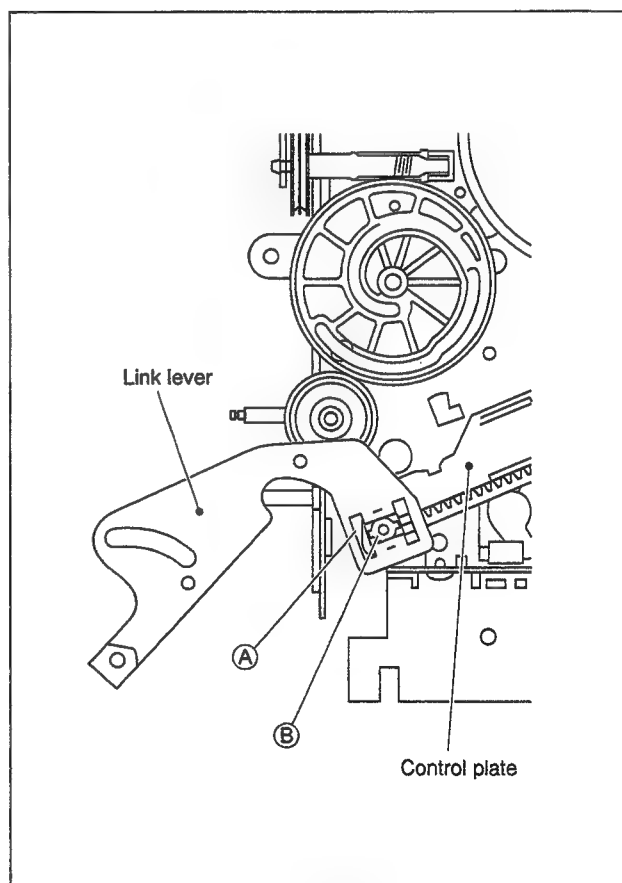


Fig. 2-3-5

- (4) Turn the link lever clockwise and mount it on the control cam center shaft (A) and the control cam left-side shaft (B). (See Fig.2-3-6).
- (5) Fasten the slit washers at two points (A) and (B).

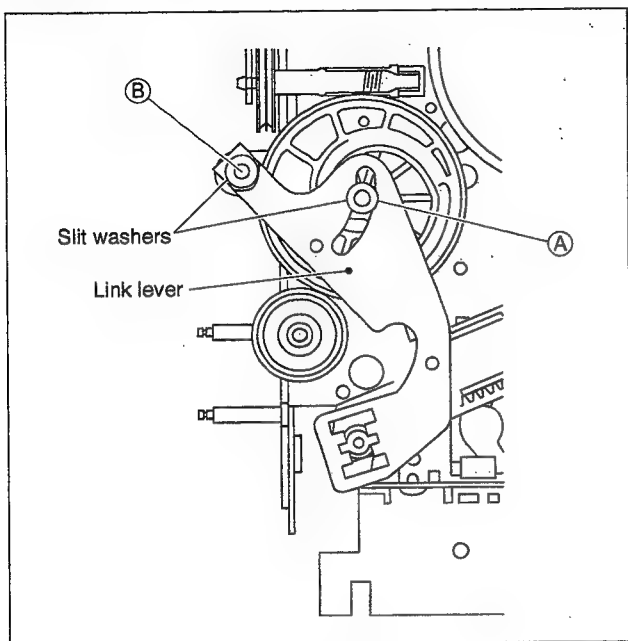


Fig. 2-3-6

2.3.6 Relay Gear, Limit Gear and Drive Gear

- (1) Install the limit gear so that the notch at its outer circumference is in alignment with the register hole of the main deck. (See Fig.2-3-7)
- (2) Install so that the notch at the outer circumference of the relay gear is in alignment with the notch of the main deck, and at the same time, that the hole A of the relay gear is in alignment with hole A of the limit gear and hole B of the relay gear with hole B of the drive gear. (See Fig.2-3-7)

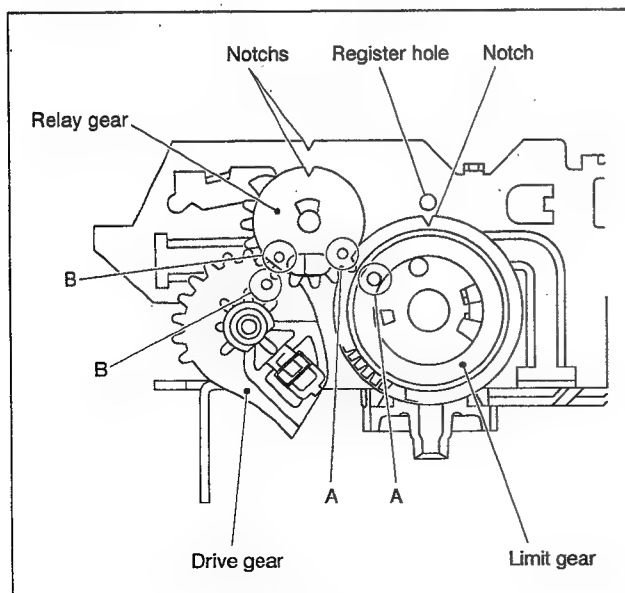


Fig. 2-3-7

2.4 COMPATIBILITY ADJUSTMENT

Notes: • Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.

- To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.

2.4.1 Checking/Adjustment of FM Waveform Linearity

- (1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.F.F) of the main board assembly for external sync connection.
- (2) Playing the alignment tape MHPE, observe the FM waveform.
- (3) Press the channel buttons (+) and (-) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)
- (4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (Fig.2-4-1)
- (5) Slightly loosen the set screw under the pole base assembly with a 1.25 mm hexagonal wrench (Take care not to loosen too much). (Fig.2-4-2)
- (6) Reduce the FM waveform while pressing the channel buttons (+, -) during playback. If a drop in level is found on the left side as shown in Fig.2-4-3, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear. If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (Fig.2-4-3)
- (7) Then play MHPE-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
- (8) After adjustment, tighten the set screw under the pole base assembly. (Take care not to tighten too much)
- (9) After tightening the set screw, play the alignment tape MHPE and MHPE-L again to make sure that the FM waveform has correct variation.

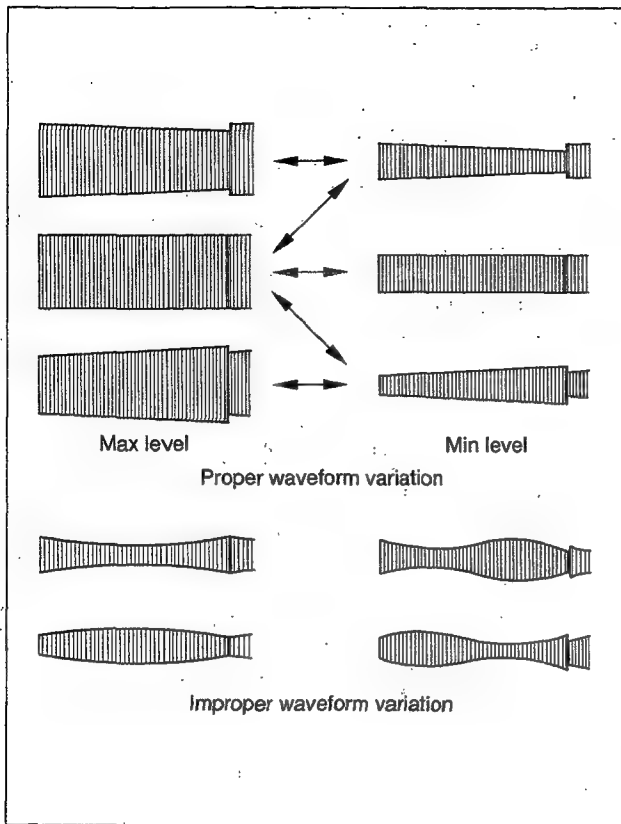


Fig. 2-4-1

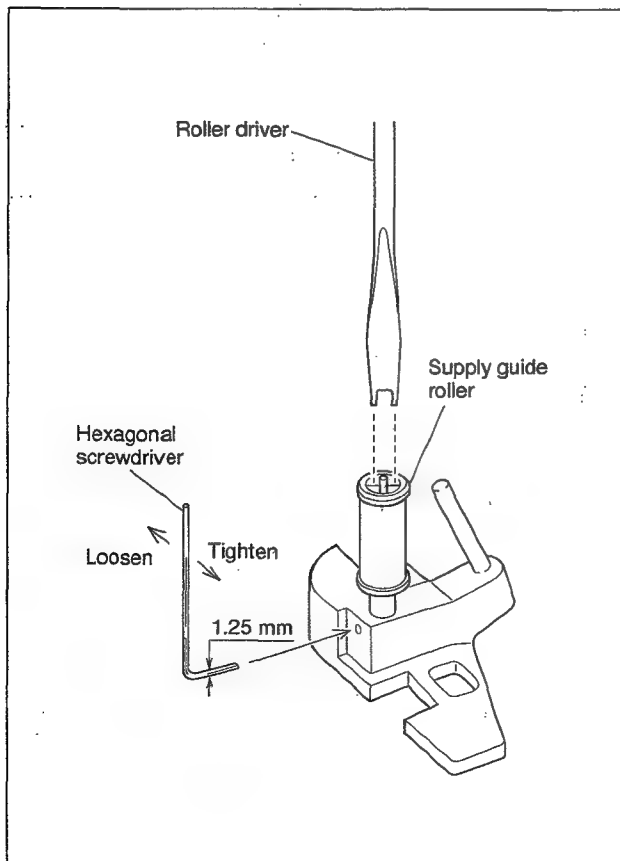


Fig. 2-4-2

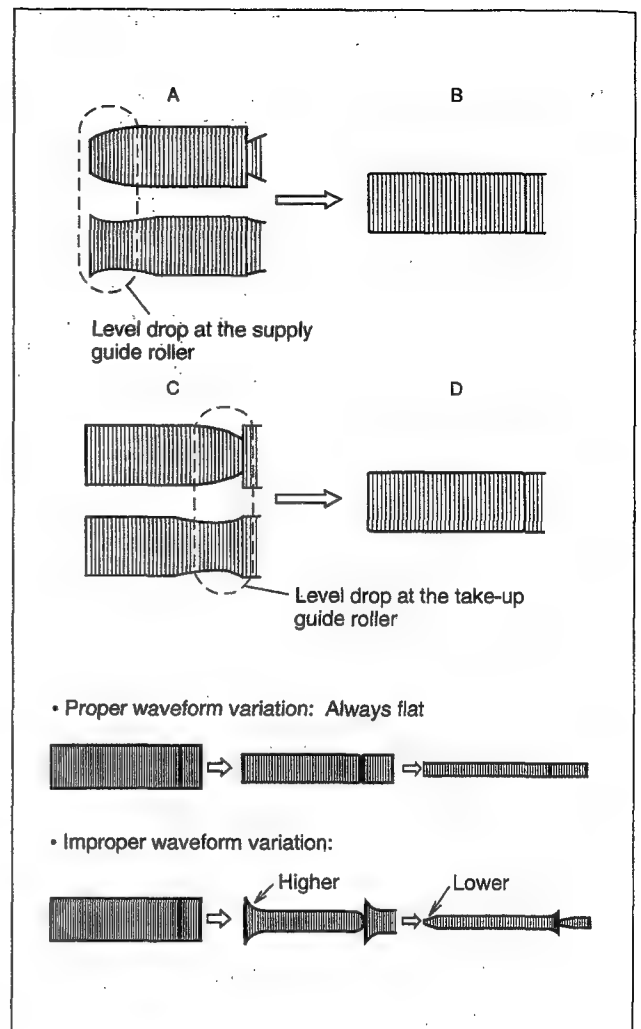


Fig. 2-4-3

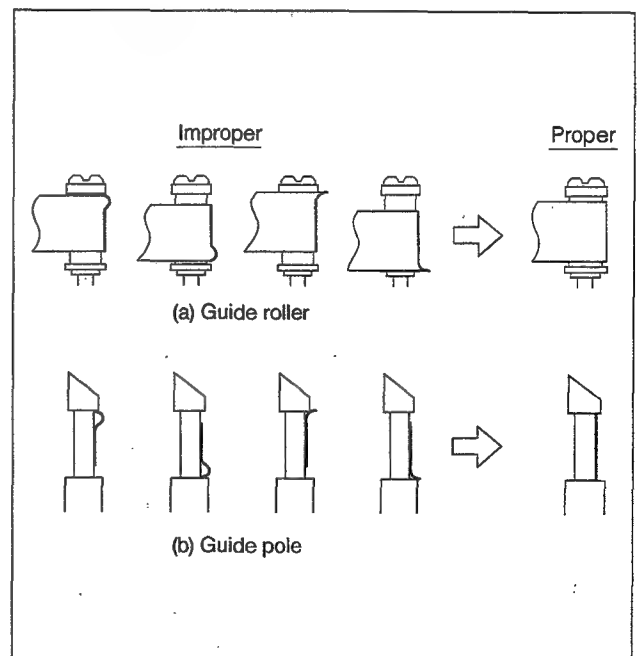


Fig. 2-4-4

2.4.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

Note: Set a temporary level of the height of the A/C head in advance to make the adjustment easier. (See Fig.2-2-14)

- (1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL P) of the main board and observe the waveforms on both channels in the ALT mode.
- (2) Play the alignment tape MHPE and adjust it by turning screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. Screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

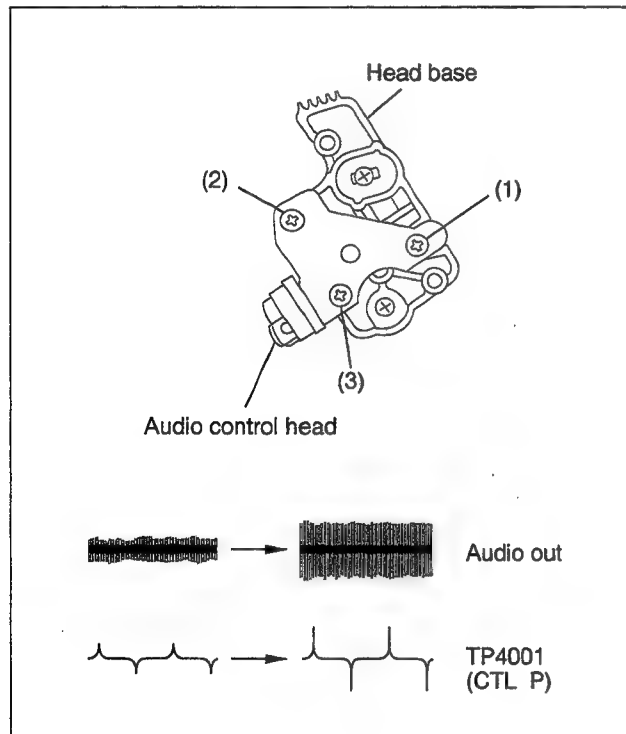


Fig. 2-4-5

2.4.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

- (1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
- (2) Play the alignment tape MHPE and observe the FM waveforms.
- (3) Press the channel buttons (+) and (-) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)
- (4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-4-6.
- (5) Turn the A/C head position and first move the audio control head fully up to the capstan head. Then gradually return the audio control head toward the drum and stop it where the FM waveform reaches its maximum for the first time. Then tighten screw (4) temporarily.

- (6) Then play the alignment tape MHPE-L.
- (7) Press the channel buttons (+) and (-) buttons simultaneously during playback to enter the manual tracking mode (This also brings the tracking to the center.)
- (8) Perform the tracking operation and make sure that the FM waveform is at its maximum.
- (9) If it is not at maximum, loosen the temporarily tightened screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten screws (4) and (5).

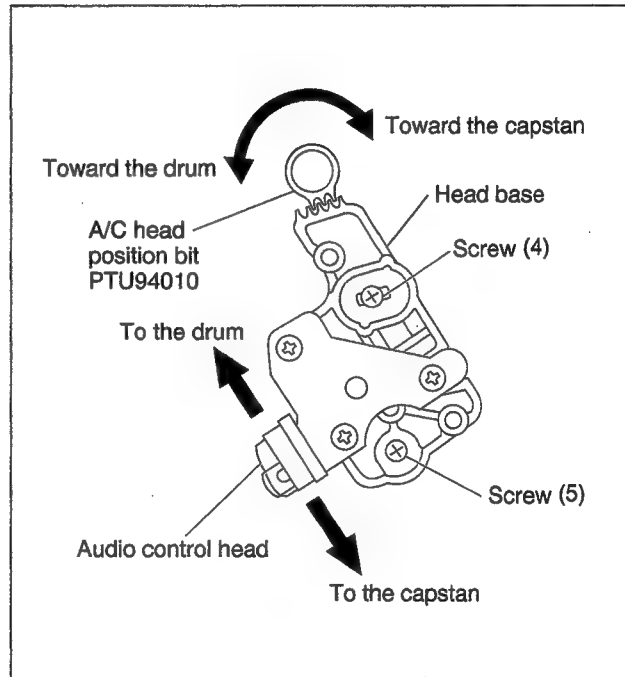


Fig. 2-4-6

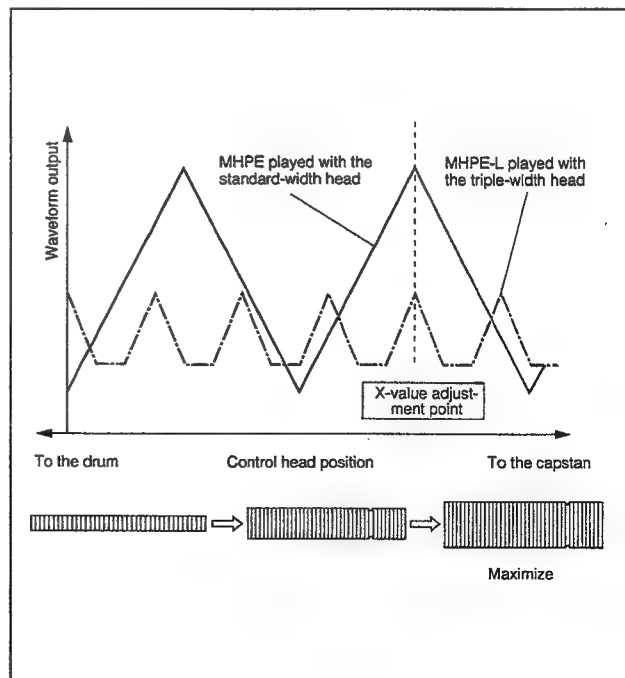


Fig. 2-4-7

2.4.4 Checking the LP mode Auto Tracking

Note: Set the remote control cable of the video recorder to A mode.
(The unit set in B mode does not accept the remote control cable of the presetting unit.)

- (1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
- (2) Playing the alignment tape MHPE and observing the FM waveform, make sure that the auto tracking operation is complete.
- (3) Press the button "D" of the presetting unit twice.
- (4) Make sure that the MHPE-L is not ejected.
- (5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

2.4.5 Checking/Adjustment of the Tension Pole

- (1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 29 - 46 g-cm.
- (2) If the indicated value is outside this range, carry out the following adjustment steps.
 - 1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE)
 - 2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver while taking care not to touch the 2.5 mm dia. pole. (See Fig.2-4-8).

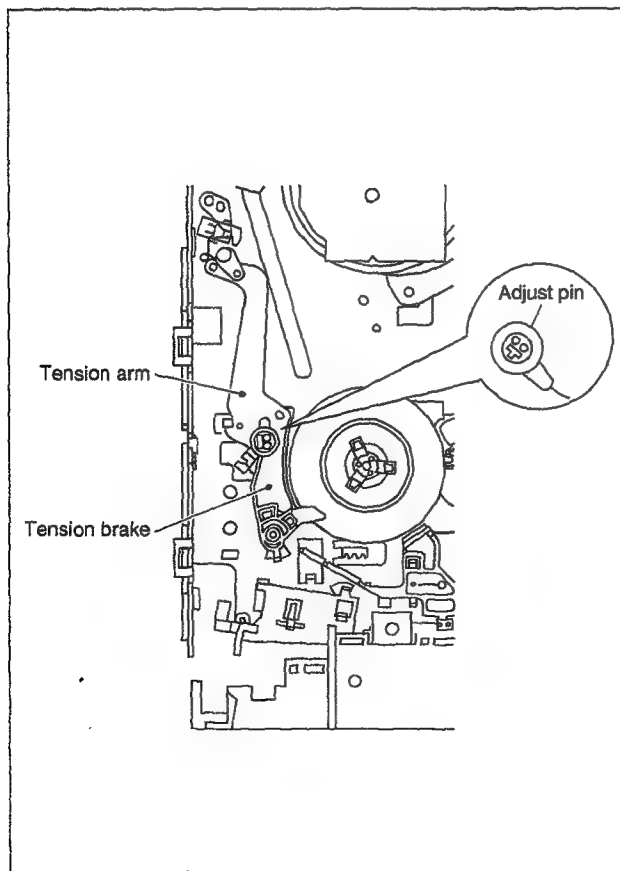


Fig. 2-4-8

2.4.6 Adjustment of the Tension Stud

- (1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck as indicated in Fig.2-4-9.

Note: Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.

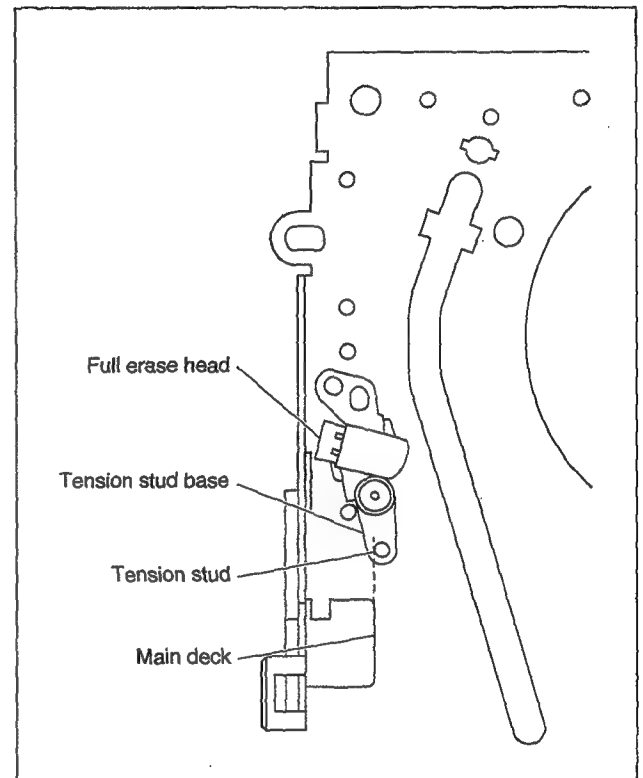


Fig. 2-4-9

2.4.7 Main Brake Torque Adjustment

Note: Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake or the reel base on the supply or take-up side have been replaced, removed or attached.

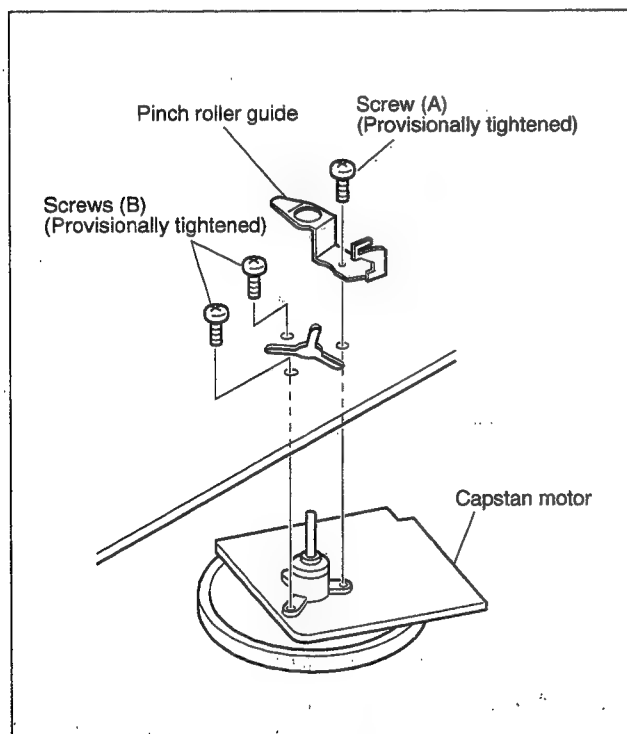
- (1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
- (2) Insert a torque gauge (PUJ48075-2) into the reel base on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel base starts to slip.
- (3) Make sure that the main brake torque values on the supply and take-up sides are both between $39.2 - 78.4 \times 10^{-3}$ N-m (400 - 800 gf-cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.

If an adjustment by using the adjustment pin is not possible, replace the main brake.

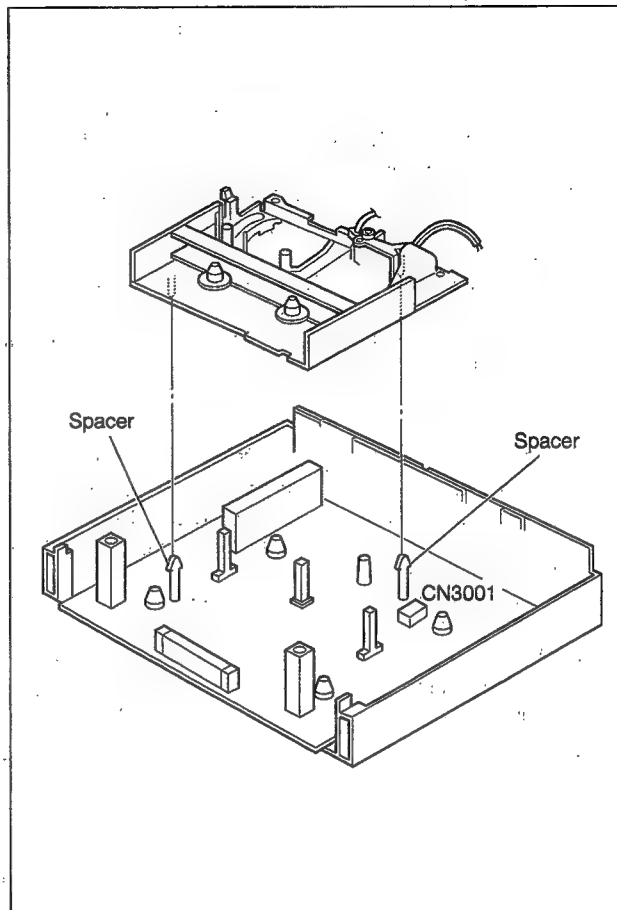
How to Mount the Capstan Motor (Centering the Mounting Position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below. (The capstan motor is centrally located when the unit is shipped from the factory.)

1. Provisionally tighten one screw (A) together the pinch roller guide and the two screws (B) securing the capstan motor.



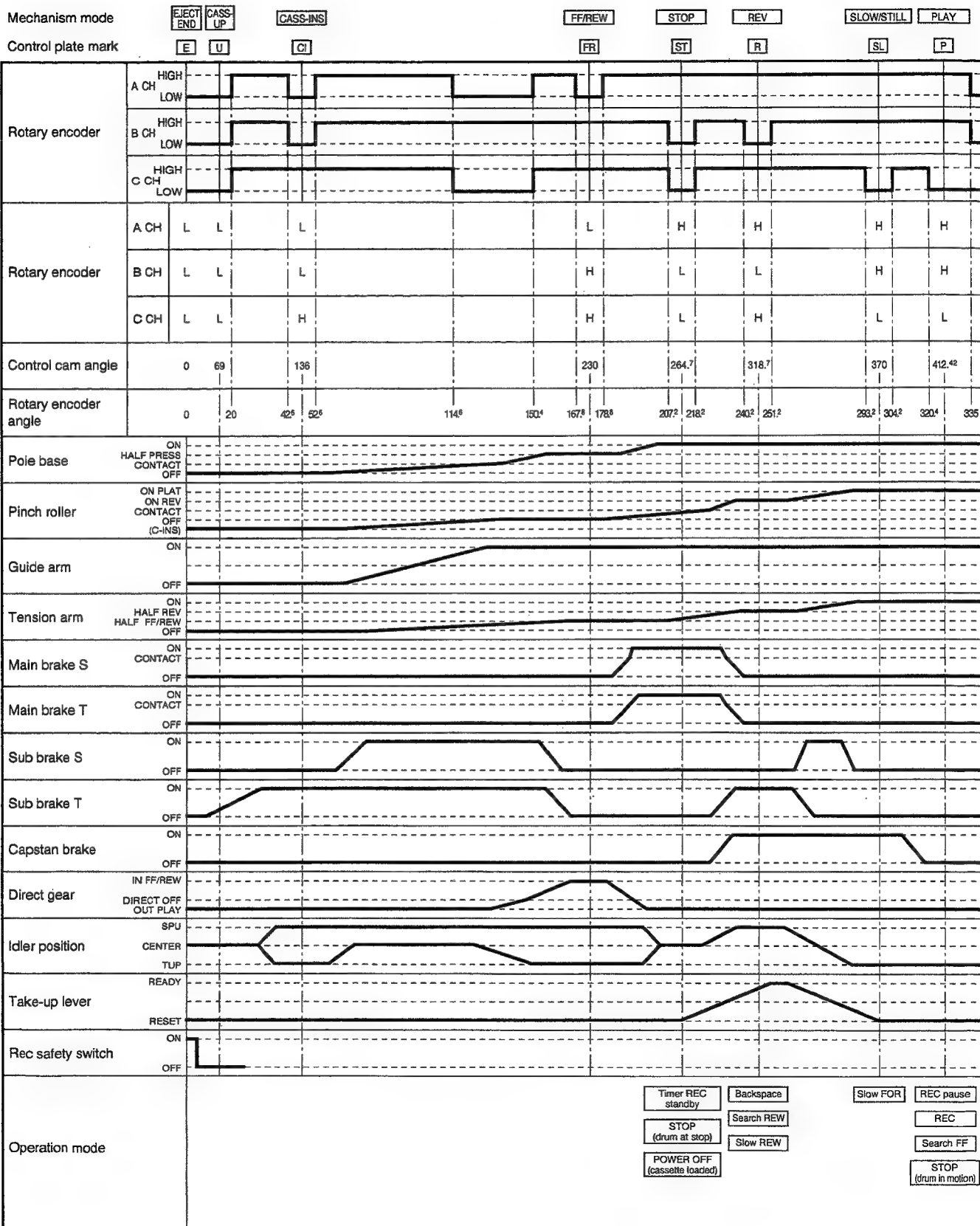
2. Install the mechanism to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism)
Make sure that all the connectors for the mechanism and the Main board are correctly installed.



3. Securely tighten the three screws (A), especially making sure that the connector CN3001 of the capstan motor is correctly mounted.

Note: When the capstan motor has been replaced with a new one, perform recording in the LP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).

Mechanism Timing Chart



SECTION 3 ELECTRICAL ADJUSTMENT

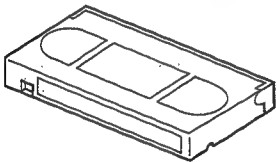
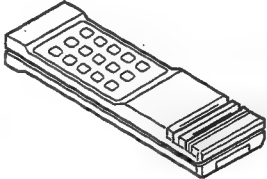
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

- ① Colour television or monitor
- ② Oscilloscope: wide-band, dual-trace, triggered delayed sweep
- ③ Frequency counter
- ④ Digital voltmeter
- ⑤ Signal generator: RF/IF sweep/marker
- ⑥ Signal generator: PAL/NTSC colour bar, stairstep
- ⑦ Recording tape
- ⑧ Numeric-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Presetting unit PTU94008
	

Note:

*The system control circuit of this model has an automatic recognition about the ON-OFF control of the **DOCTOR SYSTEM**.*

3.1.3 Colour bar signal, colour bar pattern

● PAL colour bar signal

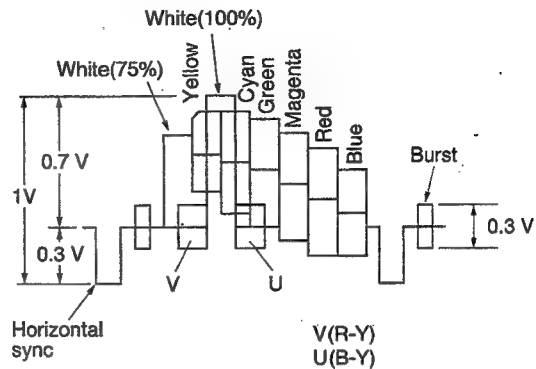


Fig.3-1-1 PAL colour bar signal waveform

● PAL colour bar pattern

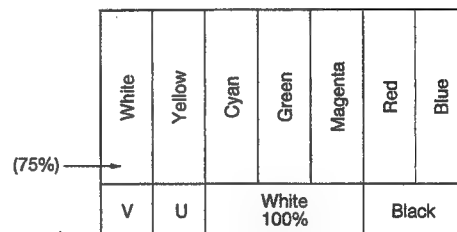


Fig.3-1-2 PAL colour bar pattern

● NTSC colour bar signal

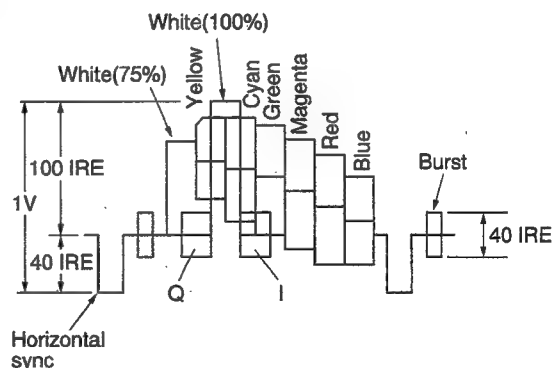


Fig.3-1-3 NTSC colour bar signal waveform

● NTSC colour bar pattern

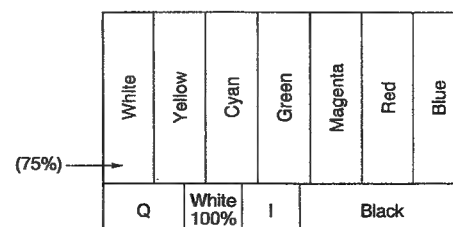


Fig.3-1-4 NTSC colour bar pattern

3.2 SERVO CIRCUIT

Notes: • Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.

- Set VCR to the mode A by remote controller.
- Use only buttons "O", depressing other buttons during adjustment may cause adjustment errors.

3.2.1 PB switching point

Signal	• Alignment tape [MHPE], Stairstep
Mode	• PB
Equipment	• Oscilloscope
Specification	• STOP mode

- (1) Playback the stairstep signal of the alignment tape.
 - (2) Press the "O" button of the presetting unit.
 - (3) The adjustment is performed automatically.
- Once the adjustment is performed, the VCR will go into the STOP mode.

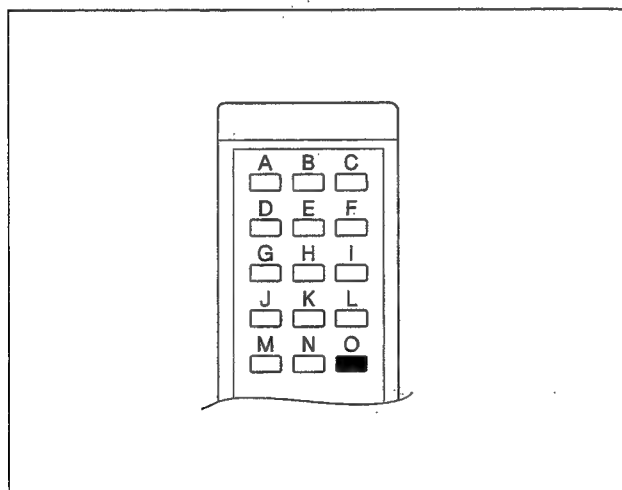


Fig.3-2-1 Presetting unit

3.2.2 Slow tracking preset

Signal	• Colour bar (PAL, NTSC)
Mode	• SP/LP: PAL REC → PB(SLOW) • SP/EP: NTSC
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note: Set VCR to the mode A by remote controller. Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.

- (1) Record a colour bar signal in the SP mode.
- (2) Playback recorded signal on the FWD slow mode.
- (3) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B" or "C" buttons of the presetting unit.
- (4) Depress the STOP button.
- (5) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
- (6) Record a colour bar signal in the LP mode.
- (7) Repeat steps (2) to (5) in the FWD slow mode.
- (8) Repeat steps (2) to (5) in the REV slow mode.
- (9) Repeat steps (1) to (8) in the NTSC mode.

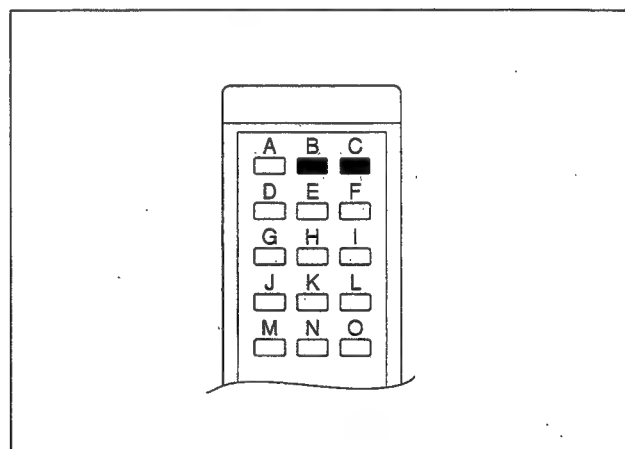


Fig.3-2-2 Presetting unit

3.3 VIDEO CIRCUIT

Notes: • Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.

- Set VCR to the mode A by remote controller.

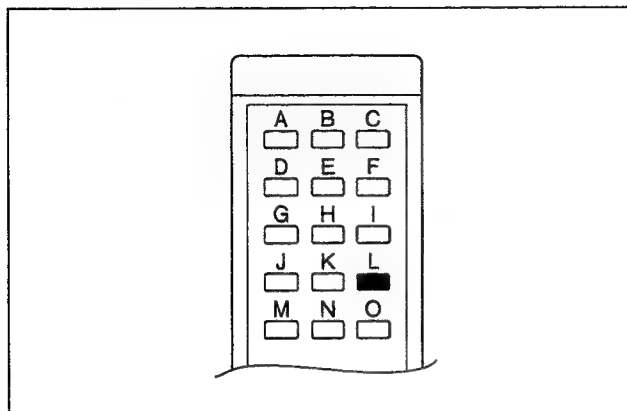


Fig.3-3-1 Presetting unit

- (1) Connect the frequency counter to TL3001(SYS.CLK) round and GND.
- (2) Connect the short wire between TL3003(TEST) round and Vcc(5V).
- (3) Short the leads of capacitor C3015 once in order to reset the IC3001.
- (4) Disconnect the short wire between TL3003 and Vcc (5 V) then connect it again quickly.
- (5) Adjust the C3018 trimmer capacitor so that the output from TL3001(SYS.CLK) falls within the 1024.008 ± 0.001 Hz (976.5549 ± 0.0010 μ sec.) range.

3.5 ON SCREEN CIRCUIT

Notes: • Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.

- Set VCR to the mode A by remote controller.

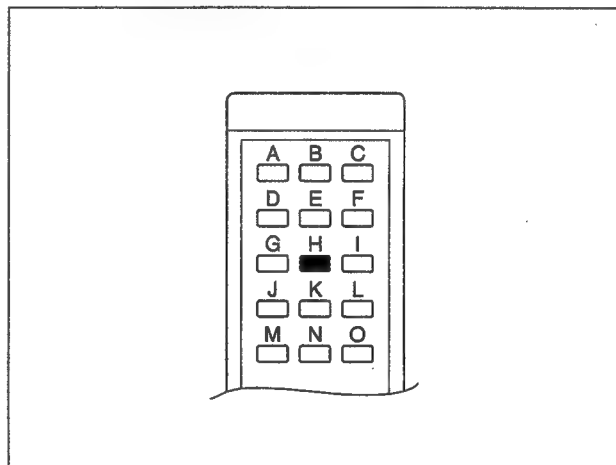


Fig.3-5-1 Presetting unit

3.3.1 Auto picture

Signal	• Monoscope
Mode	<ul style="list-style-type: none"> • REC then PB • SP/LP: PAL • SP/EP: NTSC • BEST: OFF
Adjustment tool	• Presetting unit[PTU94008]
Specification	• STOP mode

- (1) Set B.E.S.T feature to OFF on MENU screen.
- (2) Record a monoscope signal in the SP mode.
- (3) Playback the recorded signal.
- (4) Press the "L" button of the presetting unit during playback.
- (5) Confirm that VCR will go into the STOP mode.
- (6) Repeat steps (2) to (5) in the LP mode.
- (7) Repeat steps (2) to (6) in the NTSC mode.

3.4 SYSCON CIRCUIT

Notes: • Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.

- When perform this adjustment, remove the MECHANISM assembly.

3.4.1 Timer clock

Signal	• No signal
Mode	• EE
Equipment	• Frequency counter
Measurement point	• TL3001 round (SYS. CLK)
Adjustment part	• C3018 (TIMER CLOCK)
Specification	<ul style="list-style-type: none"> • 1024.008 ± 0.001 Hz [976.5549 ± 0.0010 μsec.]

3.5.1 Character position


Signal	• No signal
Mode	• EE
Equipment	• TV-monitor
Adjustment tool	• Presetting unit
Specification	• Character centre

- (1) Press the MENU button and display the on screen character.
- (2) Adjust "H" button on the presetting unit so that the character is centre position.

SECTION 4 CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions

The Components identified by the symbol  are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

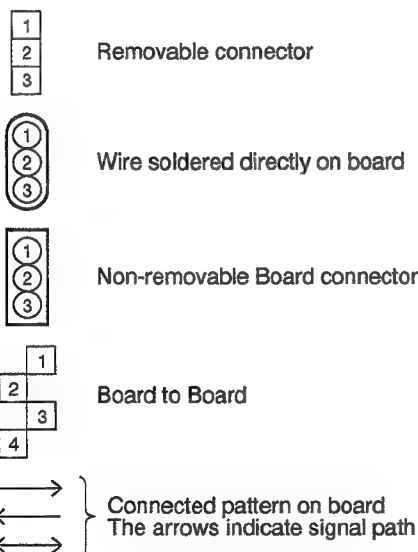
- 1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
Chip resistors are 1/16 W.
K: K Ω (1000 Ω), M: M Ω (1000K Ω)
- 2) All capacitance values are in μ F, (P: PF).
- 3) All inductance values are in μ H, (m: mH).
- 4) All diodes are 1SS133, MA165 or IN4148M (refer to parts list).

2. Indications of control voltage

AUX : Active at high

AUX or AUX(L) : Active at low

3. Interpreting Connector indications

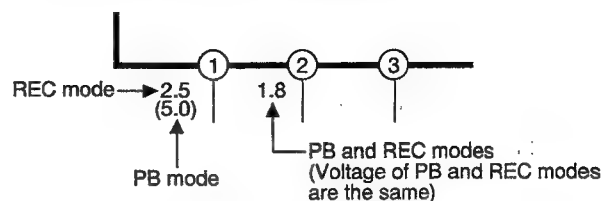


4. Voltage measurement

- 1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode
PB : Alignment tape, colour bar SP mode, normal VHS mode
— : Unmeasurable or unnecessary to measure
- 2) Audio circuits
REC : 1KHz, -8 dBs sine wave signal in SP mode, Normal VHS mode
PB : REC then playback it
- 3) Movie Camera circuits
Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode

4) Indication on schematic diagram

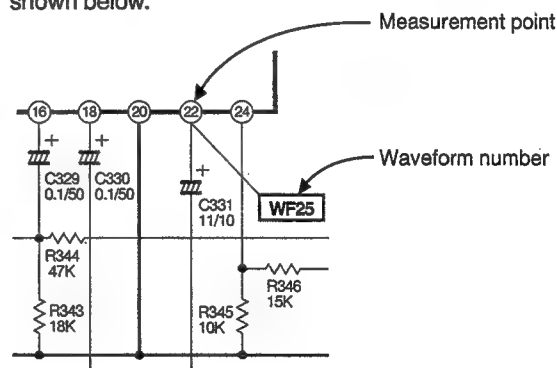
Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



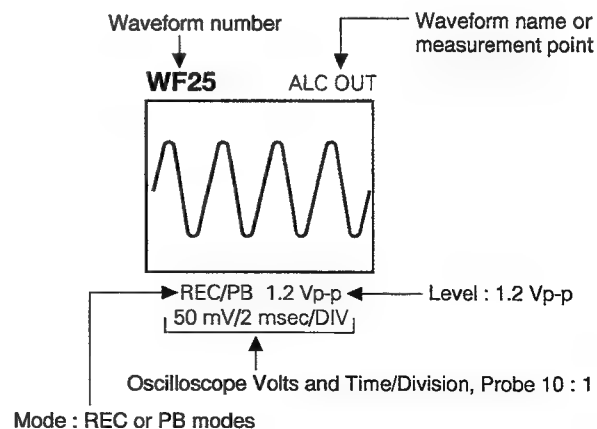
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

- 1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode
PB : Alignment tape, colour bar SP mode, normal VHS mode
- 2) Audio circuits
REC : 1KHz, -8 dBs sine wave signal in SP mode, normal VHS mode
PB : REC then playback it
- 3) Movie Camera circuits
Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
- 4) Indication on schematic diagram
Waveform indications on the schematic diagram are as shown below.

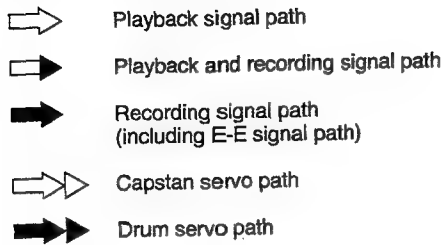


5) Waveform indications

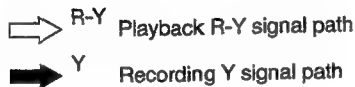


6. Signal path Symbols

The arrows indicate the signal path as follows.



(Example)



7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.



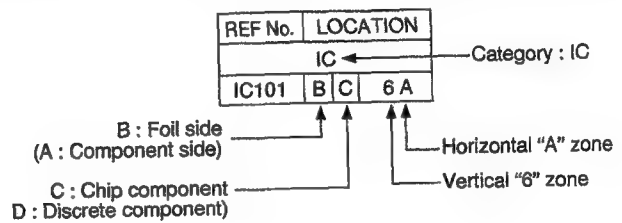
CIRCUIT BOARD NOTES

1. Foil and Component sides

- 1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.
- 2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

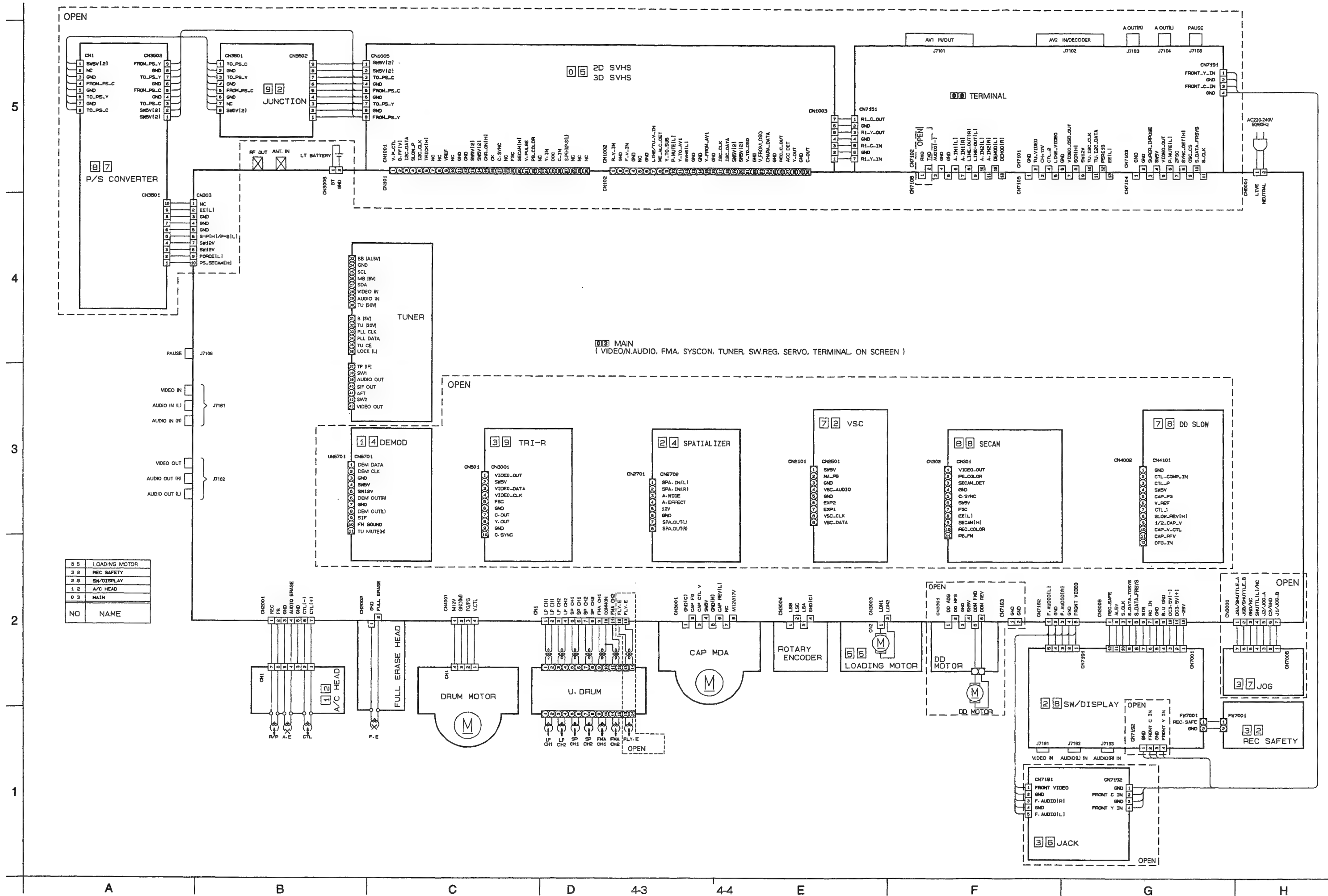
Parts location are indicated by guide scale on the circuit board.

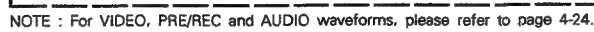


Note:

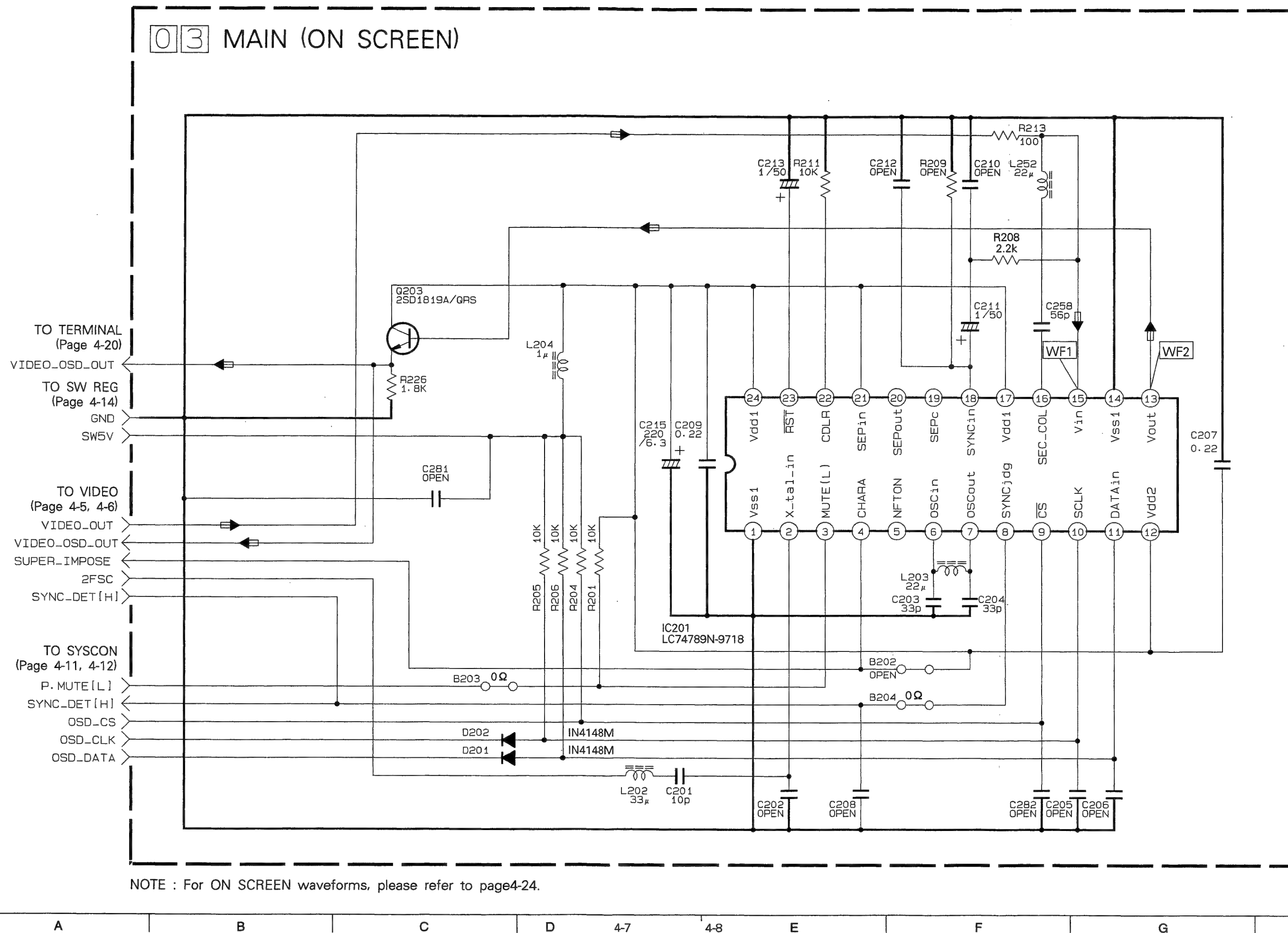
For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS

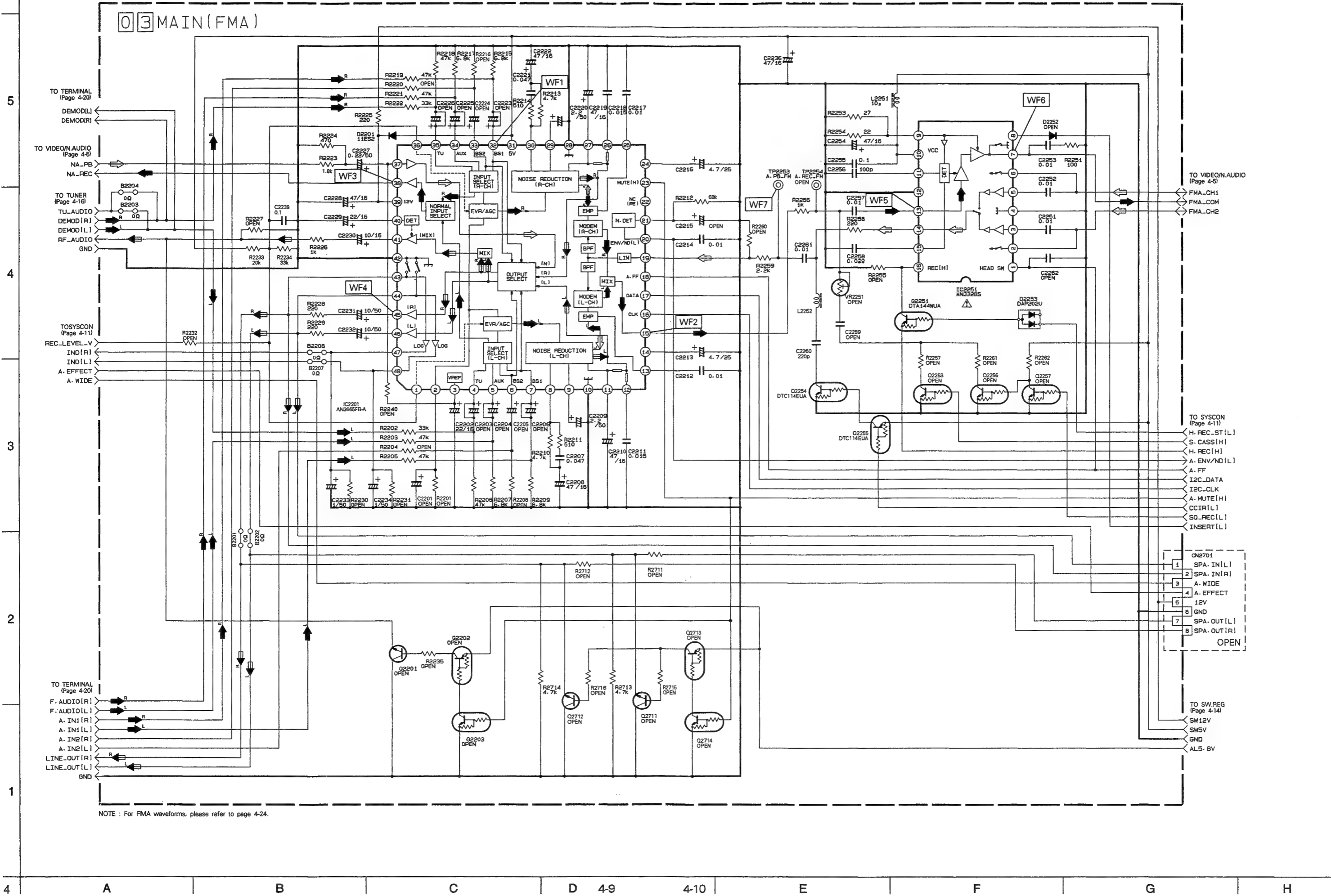


2

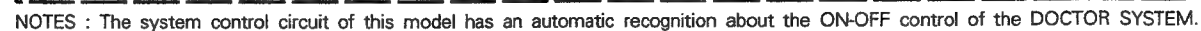
4.3 ON SCREEN SCHEMATIC DIAGRAM



4.4 FMA SCHEMATIC DIAGRAM



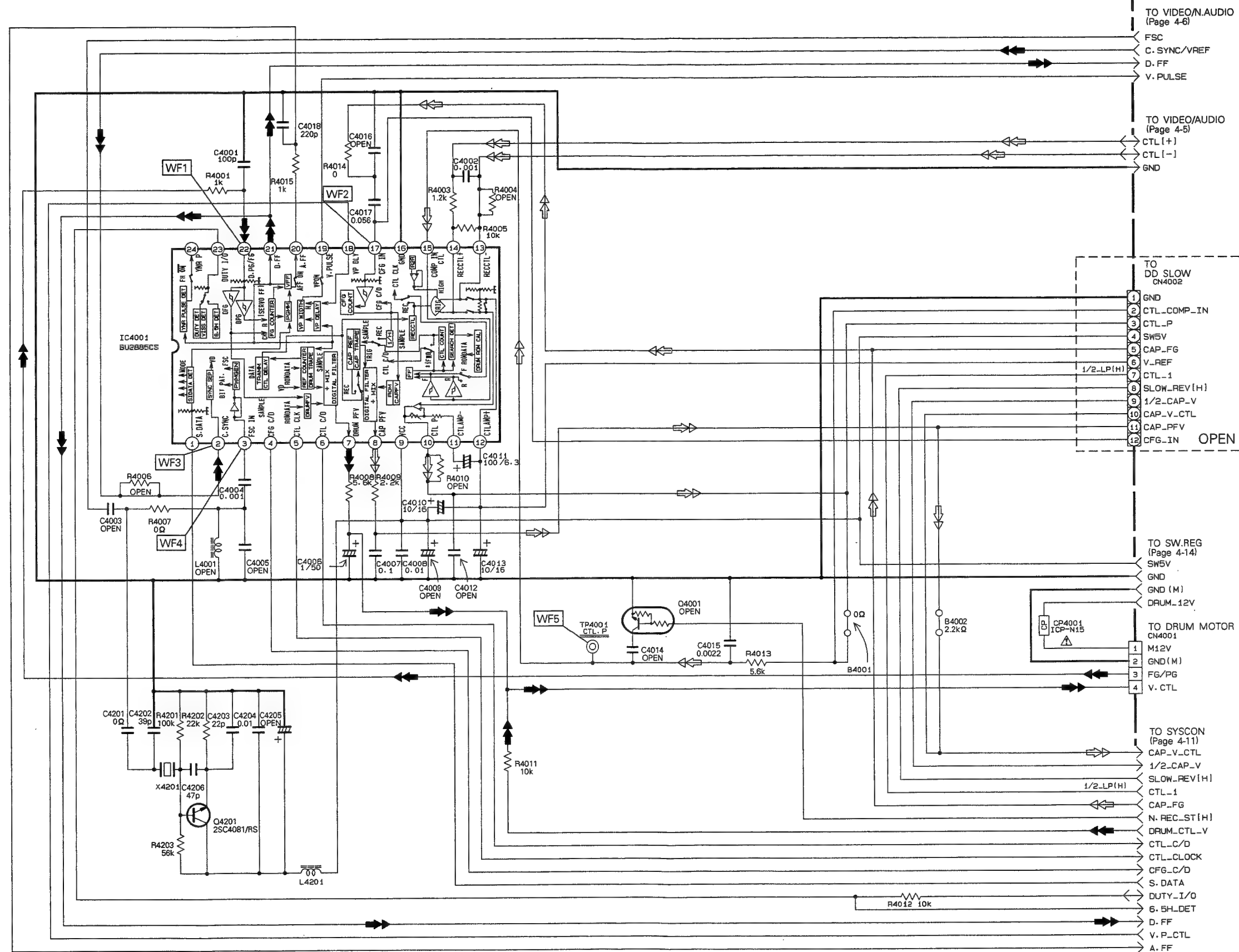
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03 MAIN[SYSCON]
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6

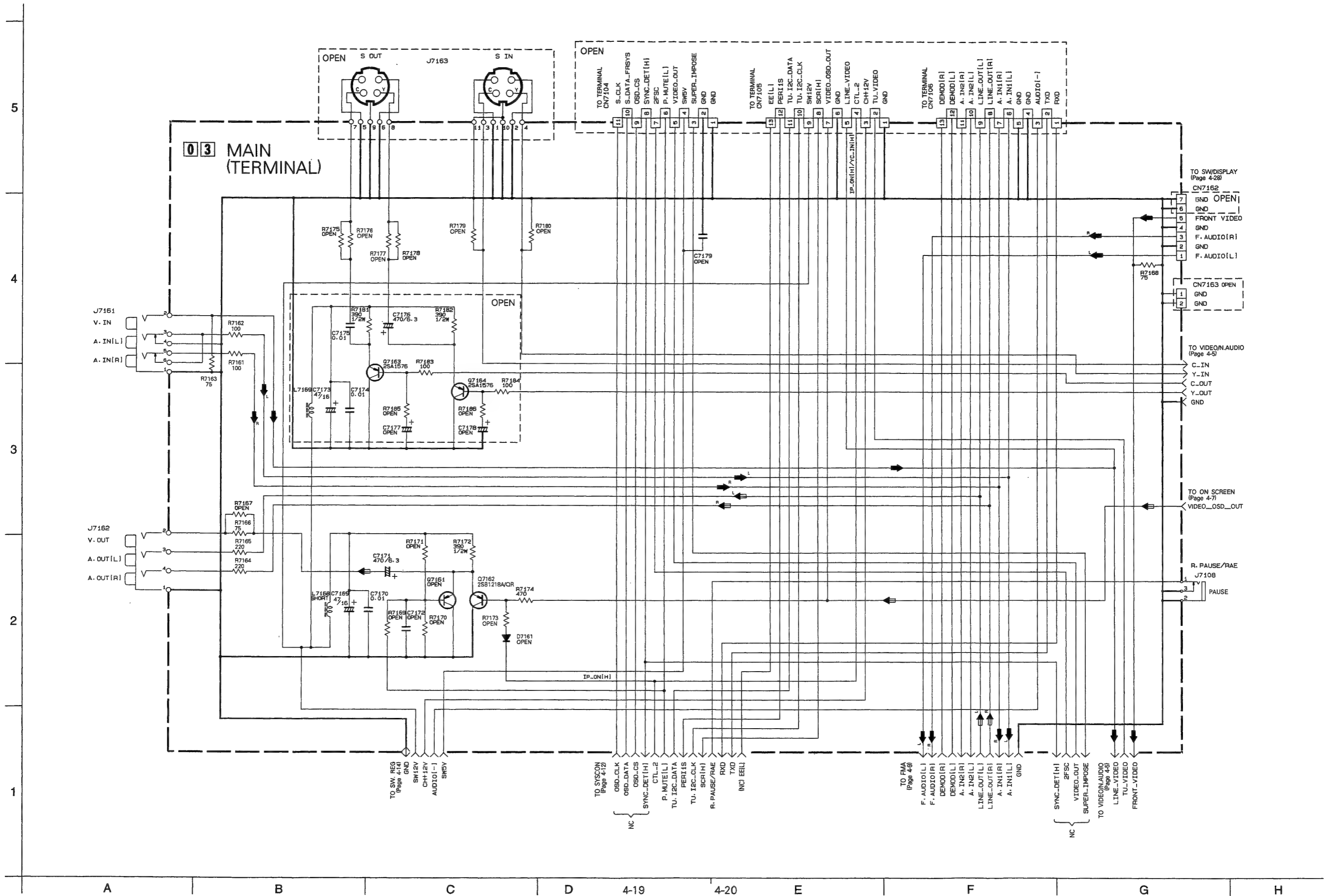


4.8 SERVO SCHEMATIC DIAGRAM

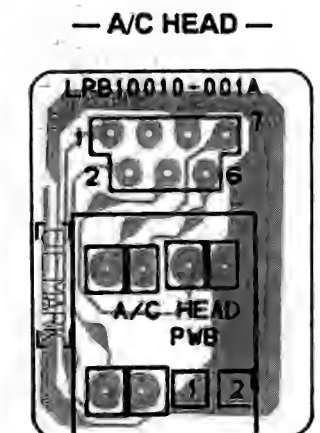
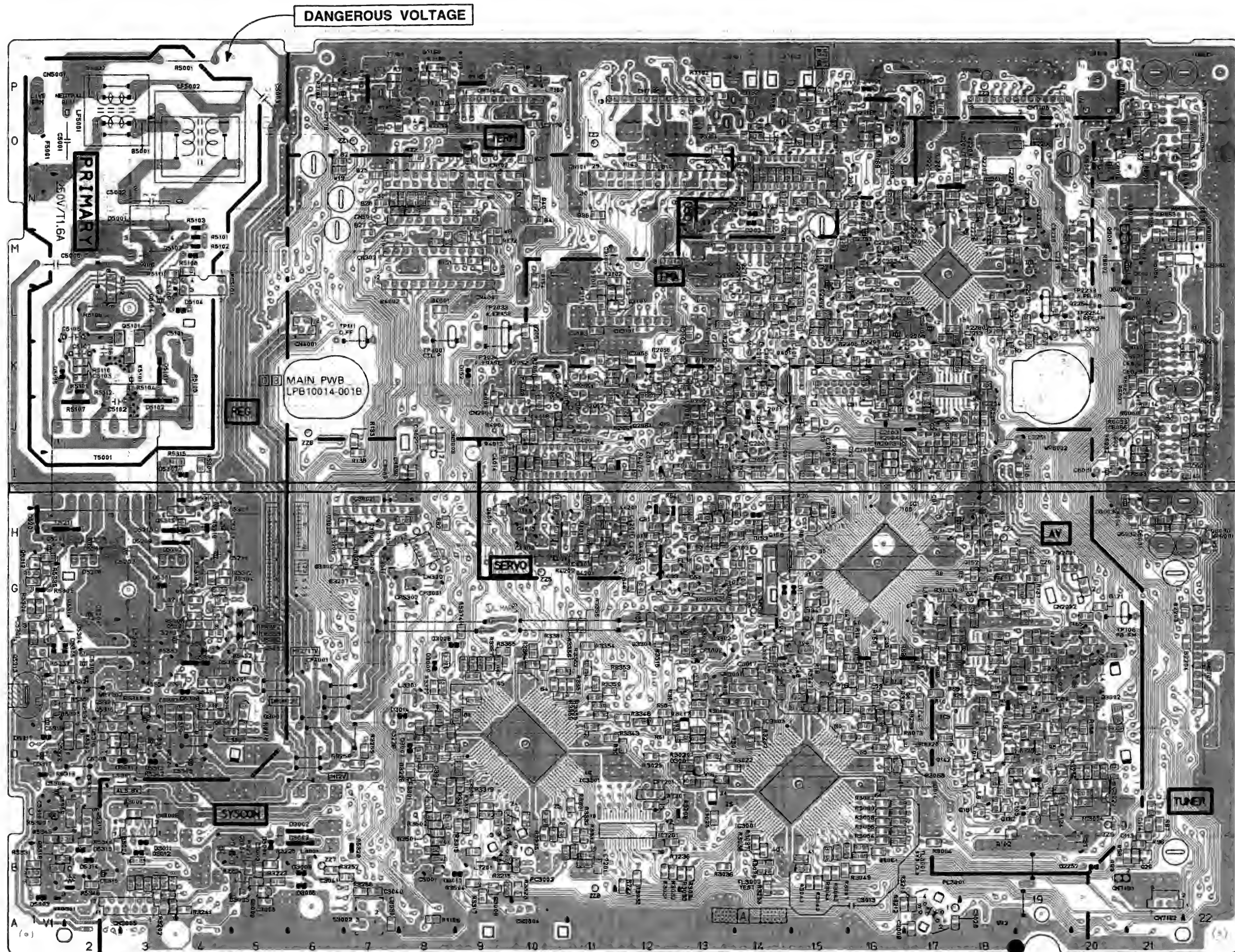


NOTE : For SERVO waveforms, please refer to page 4-24.

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4.10 MAIN AND A/C HEAD CIRCUIT BOARDS

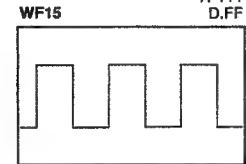
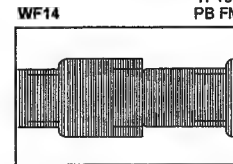
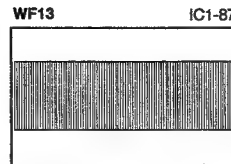
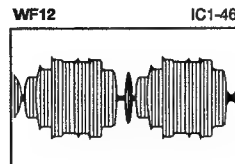
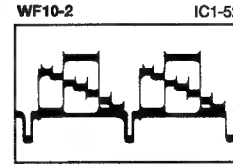
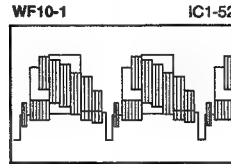
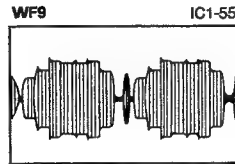
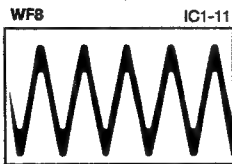
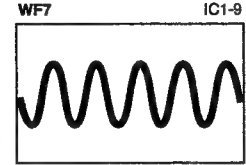
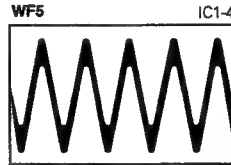
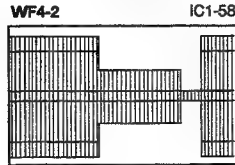
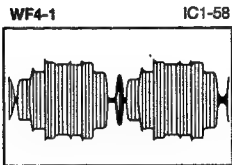
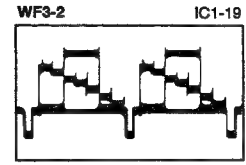
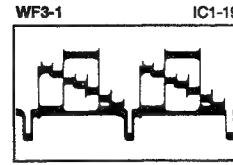
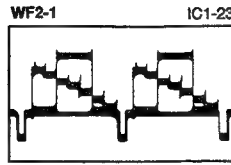
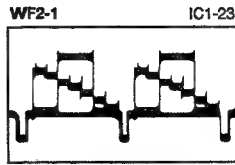
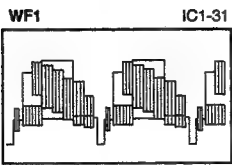


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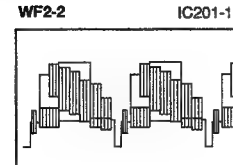
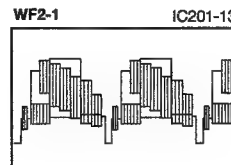
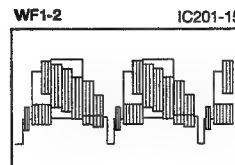
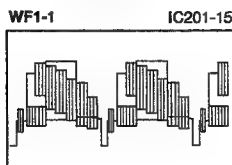
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WAVEFORMS

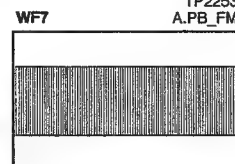
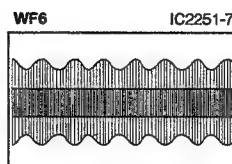
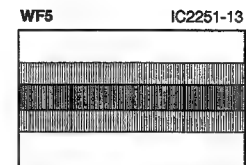
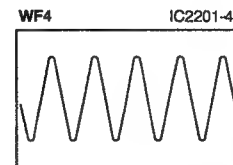
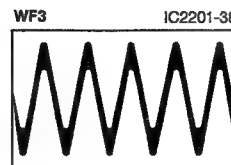
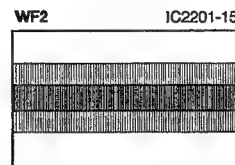
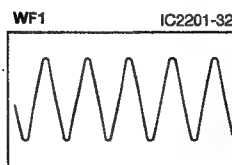
— VIDEO/AUDIO —



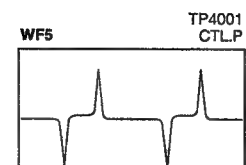
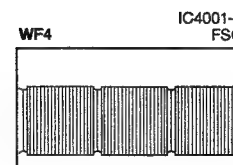
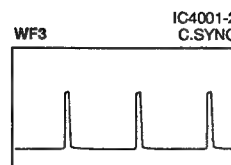
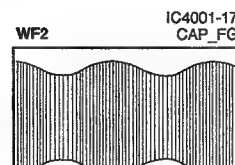
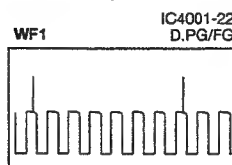
— ON SCREEN —



— FMA —

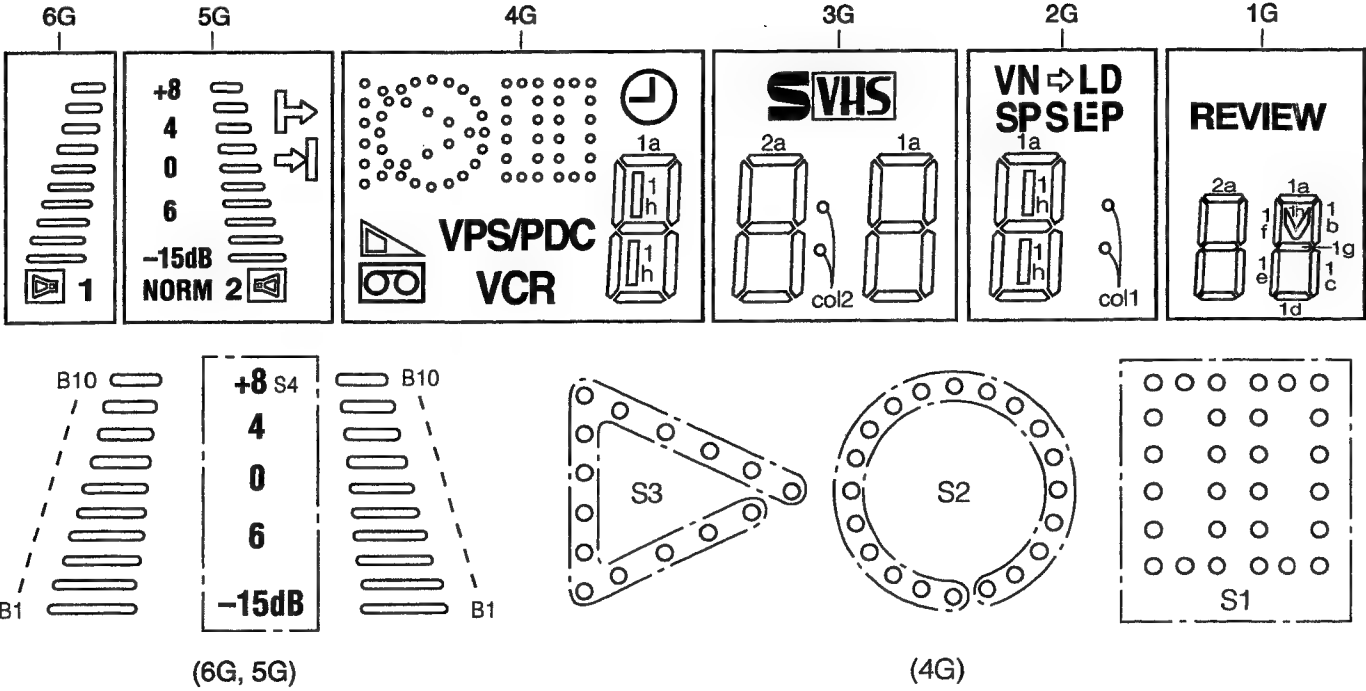


— SERVO —



4.11 FDP GRID ASSIGNMENT AND ANODE CONNECTION

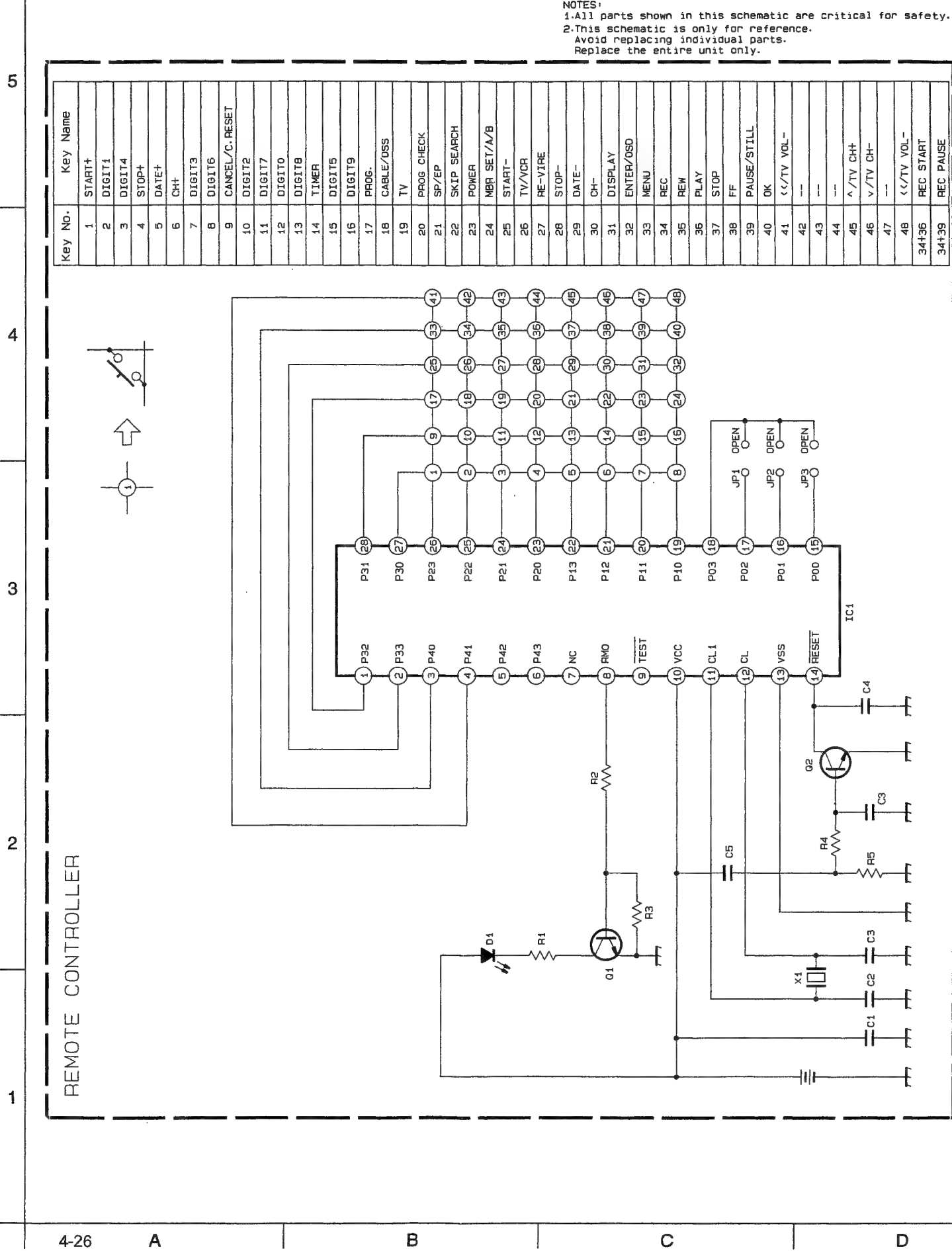
GRID ASSIGNMENT



ANODE CONNECTION

	6G	5G	4G	3G	2G	1G
P 1	—	→	S2	1a	1a	1a
P 2	—	⇨	S1	1b	1b	1b
P 3	—	S4	S3	1f	1f	1f
P 4	—	NORM	VPS/PDC	1g	1g	1g
P 5	1	2	⌚	1c	1c	1c
P 6	⏏	⏏	⏏	1e	1e	1e
P 7	B10	B10	⏏	1d	1d	1d
P 8	B9	B9	VCR	col2	1h	1h
P 9	B8	B8	1a	2a	col1	2a
P10	B7	B7	1b	2b	⇨	2b
P11	B6	B6	1f	2f	VN	2f
P12	B5	B5	1g	2g	LD	2g
P13	B4	B4	1c	2c	SP	2c
P14	B3	B3	1e	2e	S _(SEP)	2e
P15	B2	B2	1d	2d	= _(SEP)	2d
P16	B1	B1	1h	SVHS	LP _(SEP)	REVIEW

4.12 REMOTE CONTROL SCHEMATIC DIAGRAM



4.13 SW/DISPLAY AND REC SAFETY SCHEMATIC DIAGRAMS

5

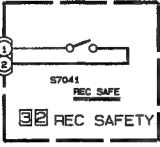
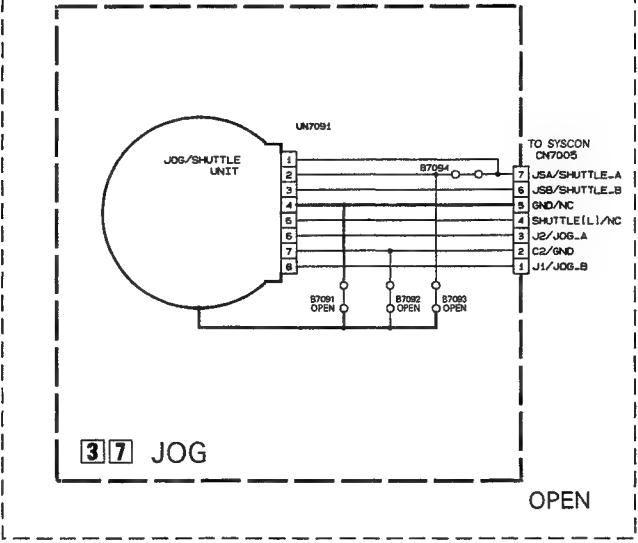
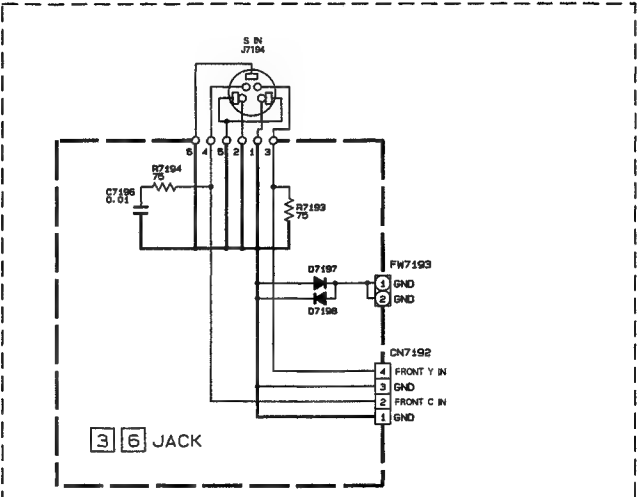
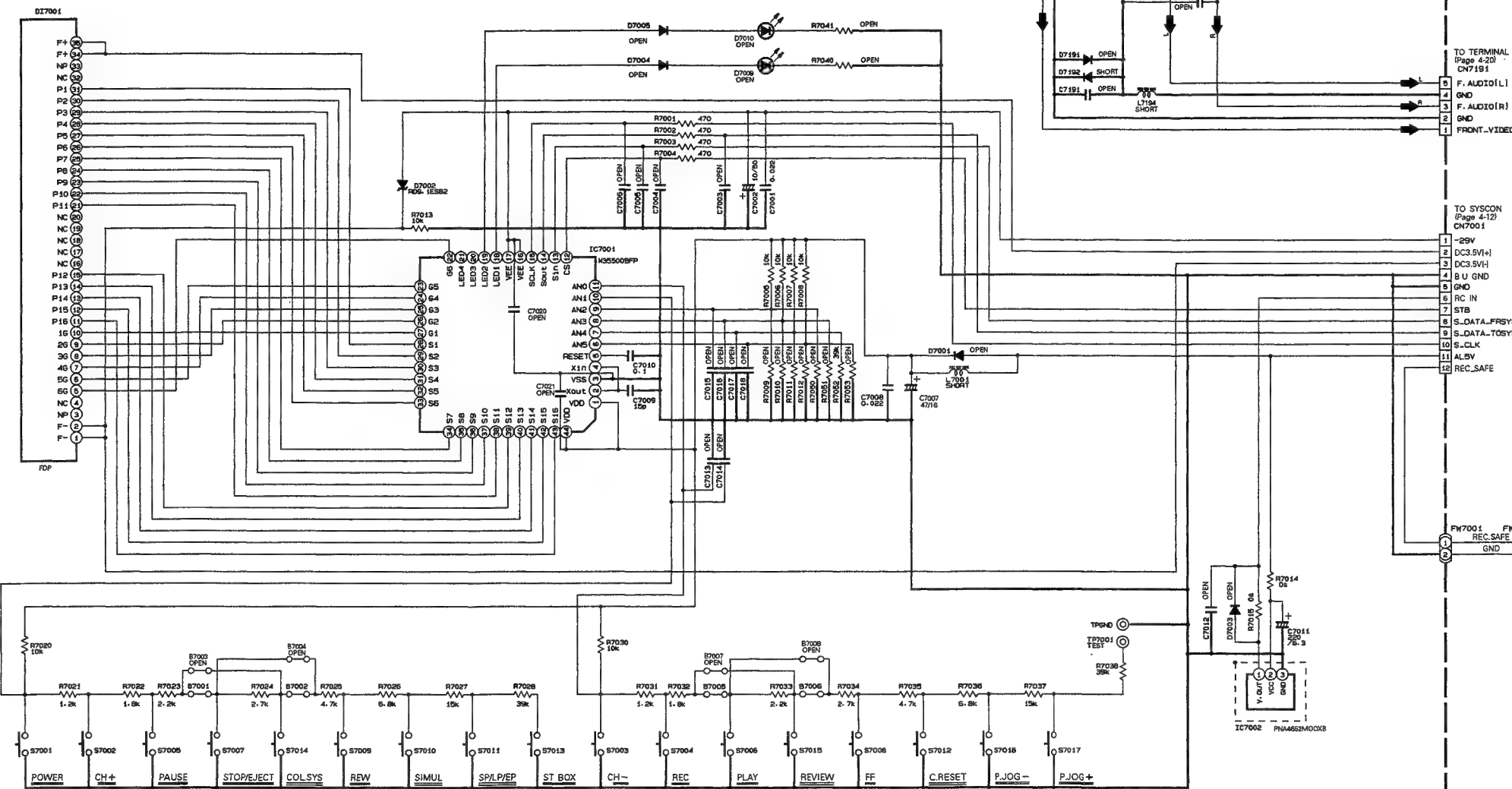
4

3

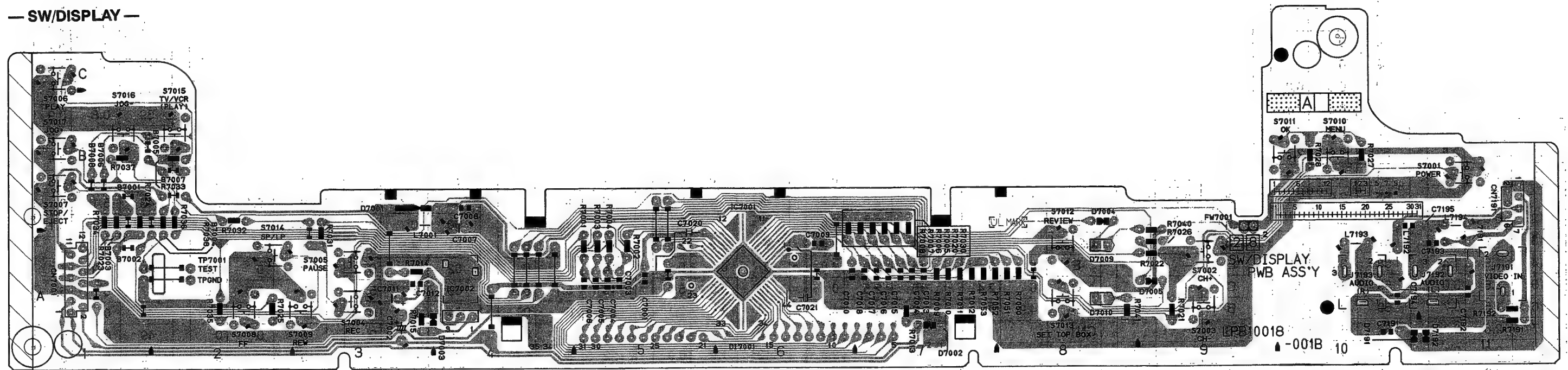
2

1

2 8 SW/DISPLAY



— SW/DISPLAY —



32 REC SAFE 57041
LPB10018
-001B
2
FW7001
REC SAFE 1 2
PWB AY

COMPONENT PARTS LOCATION GUIDE <SW/DISPLAY>												
REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION			
CAPACITOR		C7192	A D 11A	JACK		R7010	A D 7A	R7038	A D 2A	S7012	A D 8A	
C7001	A D 5A	C7193	A D 11A	J7191	A D 11A	R7011	A D 7A	R7040	A D 9A	S7013	A D 8A	
C7002	A D 3A	C7194	A D 10A	J7192	A D 11A	R7012	A D 7A	R7041	A D 8A	S7014	A D 2A	
C7003	A D 5A	C7195	A D 11A	J7193	A D 10A	R7013	A D 7A	R7050	A D 8A	S7015	A D 2B	
C7004	A D 5A	CONNECTOR		COIL		R7014	A D 3A	R7051	A D 8A	S7016	A D 1B	
C7005	A D 5A	CN7001	A D 1A	L7001	A D 4B	R7015	A D 3A	R7052	A D 7A	S7017	A D 1B	
C7006	A D 5A	CN7191	A D 11B	L7191	A D 11A	R7020	A D 7B	R7053	A D 7A	TEST POINT		
C7007	A D 4B	DIODE		L7192	A D 10A	R7021	A D 9A	R7191	A D 11A	TP7001	A D 1A	
C7008	A D 4B	D7001	A D 3B	L7193	A D 10A	R7022	A D 9A	R7192	A D 11A	TPGND	A D 1A	
C7009	A D 6A	D7002	A D 7A	L7194	A D 11A	R7023	A D 1A	SWITCH		OTHERS		
C7010	A D 6A	D7003	A D 4A	RESISTOR		R7024	A D 1B	S7001	A D 11B	D17001	A D 6A	
C7011	A D 3A	D7004	A D 8B	R7001	A D 5A	R7025	A D 2A	S7002	A D 9A	FW7001	A D 9B	
C7012	A D 3A	D7005	A D 9A	R7002	A D 5A	R7026	A D 9A	S7003	A D 9A			
C7013	A D 7A	D7006	A D 8A	R7003	A D 5A	R7027	A D 10B	S7004	A D 3A			
C7014	A D 7A	D7007	A D 8A	R7004	A D 5A	R7030	A D 7B	S7005	A D 3A			
C7015	A D 7A	D7010	A D 8A	R7005	A D 7A	R7031	A D 3B	S7006	A D 1C			
C7016	A D 7A	D7191	A D 10A	R7006	A D 7A	R7032	A D 2B	S7007	A D 1B			
C7017	A D 7A	D7192	A D 11A	R7007	A D 7A	R7033	A D 2B	S7008	A D 2A			
C7018	A D 7A	IC		R7008	A D 6A	R7034	A D 1B	S7009	A D 3A			
C7020	A D 5A	IC7001	B C 6A	R7009	A D 7A	R7035	A D 2A	S7010	A D 10B			
C7021	A D 6A	IC7002	A D 4A			R7036	A D 2A	S7011	A D 10B			
C7191	A D 10A					R7037	A D 1B					

4.15 VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.5	2.5
2	2.5	2.4
3	0	0
4	2.2	2.4
5	0	0
6	0.4	0.9
7	2.5	2.5
8	—	—
9	2.4	2.5
10	2.4	2.4
11	2.4	2.4
12	5.0	5.0
13	1.9	1.4
14	1.9	1.4
15	2.6	3.0
16	1.5	0.7
17	2.6	2.7
18	2.3	2.1
19	3.0	3.0
20	2.7	2.7
21	2.2	2.3
22	1.9	2.1
23	3.0	3.0
24	2.1	2.1
25	1.4	1.4
26	2.1	2.0
27	0	0
28	2.8	2.8
29	1.9	1.9
30	2.6	2.8
31	2.8	2.8
32	0	0
33	0	0
34	0	0
35	3.1	3.0
36	5.0	5.0
37	0	0
38	5.0	5.0
39	3.1	3.1
40	5.0	5.0
41	5.0	5.0
42	2.0	2.1
43	5.0	5.0

MODE PIN NO.	REC	PLAY
44	2.6	2.6
45	0	0
46	2.0	2.0
47	0	0
48	0	0
49	0	0
50	0.3	0.3
51	0.6	0.6
52	2.4	2.4
53	2.8	2.7
54	2.0	1.9
55	2.0	2.1
56	2.3	2.7
57	0	0
58	3.0	3.0
59	3.5	3.6
60	2.1	2.1
61	5.0	5.0
62	4.8	4.8
63	4.8	4.8
64	0	0
65	2.4	2.4
66	5.0	5.0
67	5.0	5.0
68	0	0
69	2.8	2.8
70	2.8	2.8
71	2.1	2.1
72	0	2.2
73	—	—
74	2.6	1.0
75	—	—
76	2.5	2.5
77	4.8	4.5
78	2.7	2.8
79	4.3	2.1
80	0	0
81	—	2.4
82	1.2	1.1
83	2.5	2.5
84	0	1.1
85	0	0
86	2.4	2.3
87	2.2	2.2

MODE PIN NO.	REC	PLAY
88	2.2	2.2
89	0	2.2
90	5.0	5.0
91	0	0
92	0	0
93	0	0
94	0	0
95	2.8	2.8
96	5.0	5.1
97	0	0
98	5.0	5.0
99	0.6	2.6
100	2.6	2.5
Q26		
E	—	—
C	—	—
B	—	—
Q38		
E	1.7	1.0
C	5.0	5.0
B	2.4	1.6
Q39		
E	—	—
C	—	—
B	—	—
Q152		
E	5.0	4.9
C	0	0
B	4.3	4.3
Q2001		
E	—12.4	0
C	0	0
B	—18.4	0.7
Q2002		
E	—12.3	0
C	0	0
B	—18.2	0.7
Q2003		
E	5.0	5.1
C	—18.3	5.0
B	4.9	0
Q2051		
E	0	0
C	8.1	0.3

MODE PIN NO.	REC	PLAY
B	0.5	0.3
Q2052		
E	11.3	11.4
C	11.2	2.4
B	10.6	11.4
Q2053		
E	0	0
C	0	11.3
B	5.0	0
Q2054		
E	11.2	2.4
C	11.0	0
B	10.4	2.4
Q2055		
E	0	0
C	0	2.4
B	4.9	0
CN1		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.3	2.2
6	2.3	2.2
7	2.2	2.2
8	2.2	2.2
9	4.4	0
10	0	0
11	4.4	0
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	1.7	2.5
7	2.0	2.5
CN2002		
1	0	0
2	0	0

<FMA>

MODE PIN NO.	REC	PLAY
IC2201		
1	0	0
2	0	0
3	2.5	2.5
4	0	0
5	0	0
6	2.5	2.5
7	0	0
8	2.5	2.5
9	1.5	1.5
10	0	0
11	2.5	2.5
12	2.5	2.5
13	2.5	2.4
14	2.0	2.0
15	2.5	0
16	4.8	4.8
17	4.9	4.8
18	0	2.8
19	0	0
20	0	0
21	0	2.7
22	—	—
23	0	0
24	2.0	2.1
25	2.5	2.4
26	2.5	2.5
27	0	2.5
28	0	0
29	1.6	1.5
30	2.6	2.5
31	5.0	5.0
32	0	0
33	2.5	2.5
34	0	0
35	0	0
36	0	0
37	2.4	2.5
38	2.5	2.5
39	9.3	9.4
40	0	0.5
41	4.3	4.3
42	0	0
43	0	0

MODE PIN NO.	REC	PLAY
44	0	0
45	4.3	4.3
46	4.6	4.4
47	3.6	3.1
48	1.0	3.0
IC2251		
1	0	—
2	4.4	0
3	0.5	0.6
4	0	0
5	0.6	0.6
6	4.4	0
7	0	0
8	2.5	2.5
9	0	0
10	5.0	5.0
11	3.0	3.1
12	0	0
13	1.9	0.9
14	1.9	1.9
15	0	0
16	4.5	0.9
Q2251		
E	4.4	0
C	4.5	0.9
B	0.5	0.4
Q2254		
E	—	—
C	—	—
B	—	—
Q2255		
E	—	—
C	—	—
B	—	—

<SYSCON>

MODE PIN NO.	REC	PLAY
IC3001		
1	1.0	3.0
2	3.6	3.1
3	0	0

MODE PIN NO.	REC	PLAY
4	5.0	5.0
5	0	0
6	0	0
7	—	—
8	—	—
9	0	0
10	—	—
11	—	—
12	5.1	5.1
13	0	0
14	0	0
15	4.9	0
16	5.1	5.1
17	0	0
18	0	0
19	5.1	5.0
20	0	0
21	0	0
22	5.1	5.0
23	0	0
24	0	0
25	0	0
26	0	0.3
27	0	0
28	0.8	0.7
29	2.1	2.3
30	4.4	4.4
31	0.4	0.4
32	0.4	0.4
33	0.7	0.9
34	0	0
35	0.4	0
36	0.3	0.4
37	0	0
38	0.3	0.3
39	5.0	0
40	2.1	0
41	5.1	5.0
42	0	0
43	0	0
44	5.0	5.0
45	0	0
46	0	0
47	0	0

MODE PIN NO.	REC	PLAY
48	0	0
49	0	0
50	5.1	5.0
51	0	0
52	0	0
53	0	0
54	0	0
55	0	0
56	—	—
57	1.3	1.2
58	5.1	5.1
59	4.7	4.6
60	0	0
61	4.5	4.6
62	0	0
63	5.1	5.1
64	0	0
65	0	0
66	—	—
67	—	0
68	0	0
69	3.3	—
70	—	—
71	—	—
72	5.1	5.1
73	5.1	5.1
74	0	5.1
75	5.1	5.1
76	5.1	5.1
77	4.5	4.5
78	0	0
79	0	0
80	0	0
IC3002		
1	0	0
2	12.2	12.2
3	0	0
4	—	—
5	0	0
6	12.2	12.2
7	0	0
8	12.1	12.2
9	0	0
IC3003		

MODE PIN NO.	REC	PLAY
1	0	0
2	5.1	5.1
3	0	5.1
IC3004		
1	0	0
2	0	0
3	0	0
4	0	0
5	—	—
6	—	—
7	0	0
8	5.1	5.1
IC3301		
1	0	0
2	0	1.2
3	5.0	5.0
4	5.1	5.1
5	0	0
6	0	0
7	—	—
8	5.1	5.1
9	0	0
10	—	—
11	—	—
12	4.6	4.6
13	0	0
14	5.0	5.1
15	5.1	5.1
16	0	0
17	0	0
18	0	0
19	4.6	4.7
20	4.9	5.0
21	4.8	4.7
22	—	—
23	—	—
24	3.2	0
25	4.9	4.9
26	0	0
27	0	0
28	0	0
29	—	—
30	0.7	0.8
31	0	0

MODE PIN NO.	REC	PLAY
32	5.1	5.1
33	0	0
34	0.3	0.3
35	0.3	0.3
36	0	0.3
37	0.4	0.5
38	0	0
39	0.8	0.9
40	0.4	0.3
41	0.4	0.4
42	4.4	4.3
43	5.1	0
44	0	5.1
45	0	0
46	5.0	5.1
47	0	5.1
48	0	0
49	0	0
50	0	0
51	0	0
52	5.1	—
53	0	0
54	0	0
55	0	0
56	0	0
57	5.1	5.1
58	0	0
59	5.1	5.1
60	0	0
61	0	0
62	0	0
63	5.1	5.1
64	0	0
65	0	0
66	0	0
67	5.1	5.1
68	5.1	5.0
69	0	0
70	5.1	5.1
71	—	—
72	5.1	5.1
73	5.1	5.1
74	2.7	2.8
75	1.5	1.5

MODE PIN NO.	REC	PLAY
76	2.5	2.5
77	0	0
78	0	0
79	0	0
80	4.3	4.3
Q3001		
E	0	0
C	4.6	4.7
B	-	-
Q3002		
E	0	0
C	4.9	5.1
B	-	-
Q3003		
E	0	0
C	0	0
B	0.7	0.7
Q3005		
E	0	0
C	12.3	12.2
B	0	0
CN3001		
1	0	0
2	2.5	2.5
3	2.5	2.5
4	5.0	5.0
5	11.5	11.5
6	0	0
7	-	-
8	0	0
CN3003		
1	4.9	0
2	3.3	0
CN3004		
1	5.1	5.1
2	5.1	5.1
3	0	0
4	0	0
CN3005		
1	5.1	5.1
2	5.1	5.1
3	4.7	4.7
4	5.1	5.1
5	1.4	-

MODE PIN NO.	REC	PLAY
6	4.6	4.6
7	5.1	5.1
8	0	0
9	0	0
10	-20.2	-20.2
11	-16.7	-16.7
12	-29.0	-29.0
CN3008		
1	0.5	0.5
2	0	0

<SWITCHING REGULATOR>

MODE PIN NO.	REC	PLAY
Q5101		
S	0	0
D	171.2	169.9
G	5.9	5.7
Q5102		
E	0	0
C	5.9	5.7
B	0	0
Q5304		
E	0	0
C	0	0
B	4.6	4.5
Q5305		
E	0	0
C	11.0	11.0
B	0.5	0.6
Q5306		
E	5.2	5.2
C	6.0	6.0
B	5.8	5.8
Q5315		
E	5.2	5.1
C	5.9	5.9
B	5.8	5.8
Q5316		
E	0	0
C	5.8	5.8

MODE PIN NO.	REC	PLAY
B	0.6	0.6
Q5319		
E	11.3	11.4
C	12.2	12.3
B	12.0	12.1
Q5320		
E	12.2	12.3
C	12.2	12.2
B	0	0
Q5451		
E	-	-
C	-	-
B	-	-
Q5452		
E	-	-
C	-	-
B	-	-

<TUNER>

MODE PIN NO.	REC	PLAY
Q6033		
E	-	-
C	-	-
B	-	-
Q6035		
E	-	-
C	-	-
B	-	-

<SERVO>

MODE PIN NO.	REC	PLAY
IC4001		
1	0	0
2	0.3	0.3
3	2.4	2.4
4	0	0
5	3.1	0

MODE PIN NO.	REC	PLAY
6	5.1	-
7	1.6	1.6
8	3.0	3.0
9	5.1	5.1
10	2.5	2.5
11	2.5	2.5
12	2.5	2.5
13	1.7	2.5
14	2.8	2.5
15	2.5	2.5
16	0	0
17	2.4	2.4
18	0	0
19	0.5	0.5
20	0	-
21	-	-
22	1.7	1.6
23	5.0	5.1
24	-	-
Q4201		
E	-	-
C	-	-
B	-	-
CN4001		
1	12.2	12.2
2	0	0
3	1.5	1.5
4	1.5	1.5

<TERMINAL MAIN>

MODE PIN NO.	REC	PLAY
Q7162		
E	-	-
C	-	-
B	-	-
CN7162		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0

<ON SCREEN>

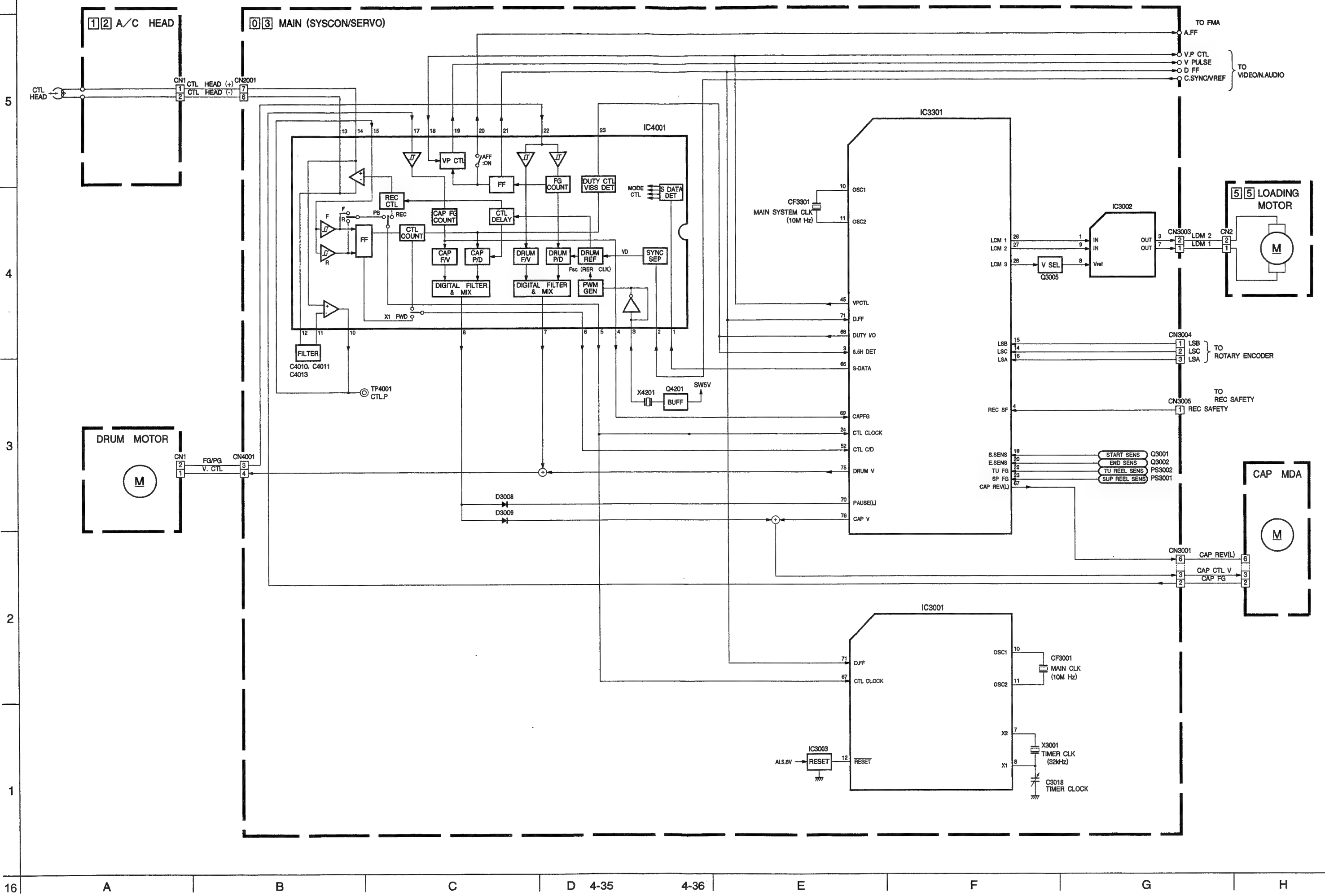
MODE PIN NO.	REC	PLAY
IC201		
1	0	0
2	2.7	2.7
3	5.1	5.1
4	0	0
5	-	-
6	-	-
7	-	-
8	5.1	5.1
9	-	-
10	4.7	4.7
11	1.5	1.4
12	5.1	5.1
13	5.1	5.1
14	2.9	2.9
15	0	0
16	1.2	1.2
17	2.6	2.6
18	5.1	5.1
19	2.1	2.2
20	0	0
21	2.2	2.2
22	1.7	1.7
23	5.1	5.1
24	3.0	3.0
25	2.6	2.6
26	-	-
27	5.1	5.1
28	3.7	3.7
29	5.1	5.1
30	5.1	5.1
Q203		
E	1.5	1.6
C	5.1	5.1
B	2.2	2.2

<SW/DISPLAY>

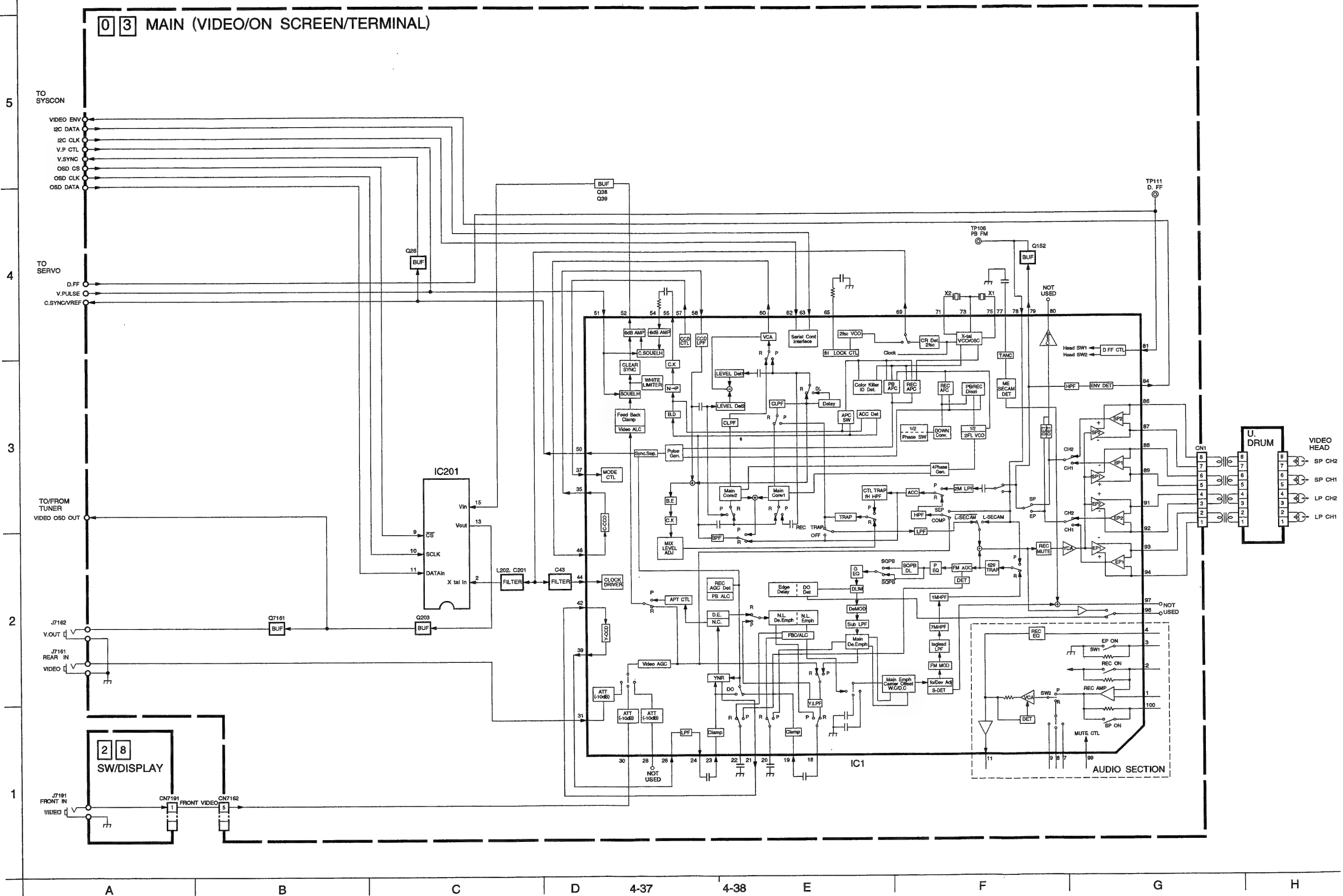
MODE PIN NO.	REC	PLAY
IC7001		
1	5.1	5.1
2	2.1	2.1
3	0	0
4	2.1	2.1
5	5.1	5.1
6	4.0	4.0
7	2.6	2.6
8	3.0	3.1
9	3.0	3.0
10	5.1	5.1
11	5.1	5.1
12	4.6	4.6
13	1.4	1.4
14	5.1	5.1
15	4.7	4.8
16	-29.1	-29.0
17	-29.1	-29.0
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-
38	-	-
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-

MODE PIN NO.	REC	PLAY
44	5.1	5.1
IC7002		
1	5.1	5.1
2	5.1	5.1
3	0	0
CN7001		
1	5.1	5.1
2	5.1	5.1
3	4.7	4.7
4	5.1	5.1
5	1.4	-
6	4.6	4.6
7	5.1	5.1
8	0	0
9	0	0
10	-20.2	-20.2
11	-16.7	-16.7
12	-29.0	-29.0
CN7191		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0

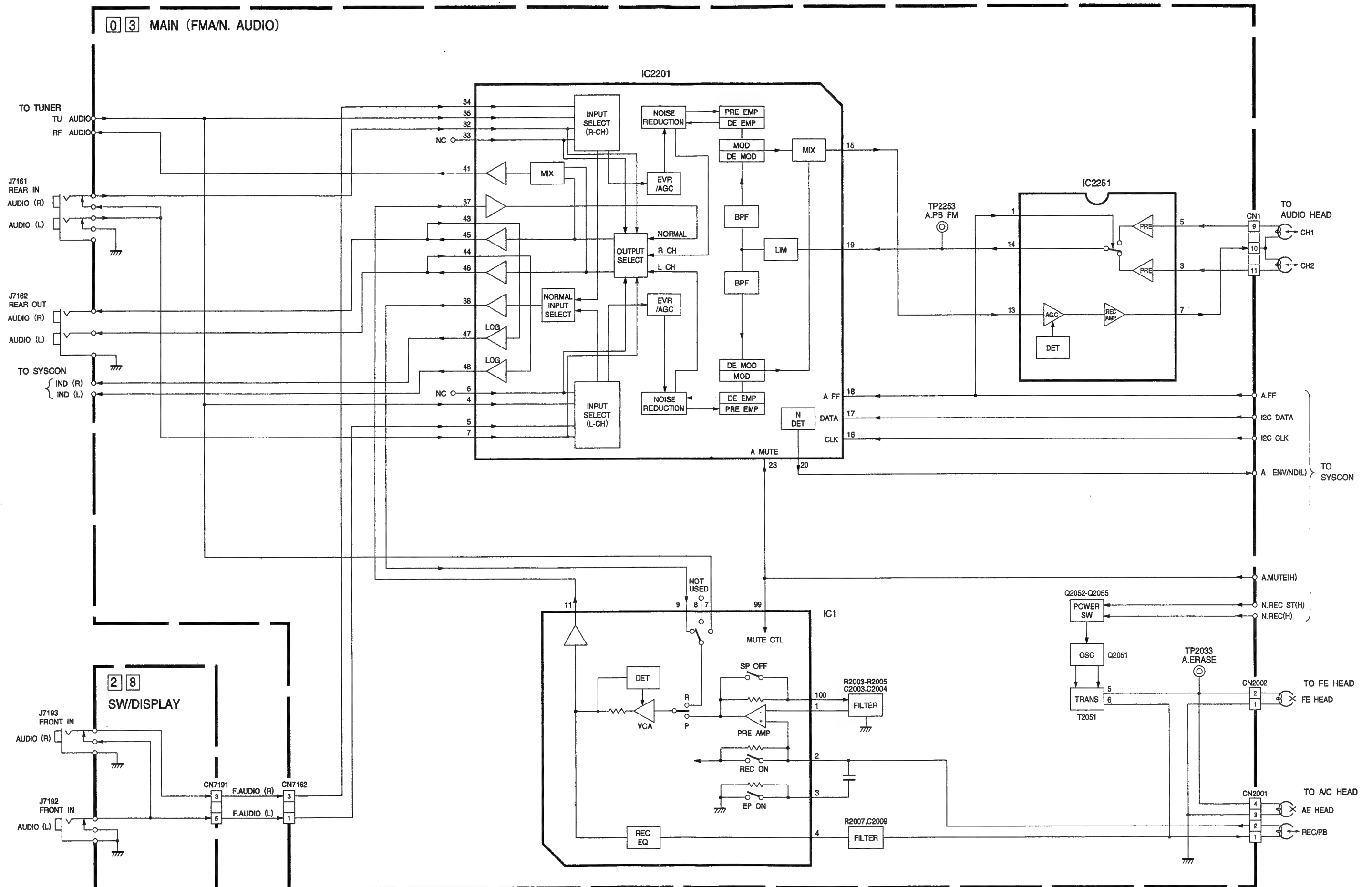
4.16 SYSTEM CONTROL/SERVO BLOCK DIAGRAM



4.17 VIDEO BLOCK DIAGRAM



4.18 AUDIO BLOCK DIAGRAM



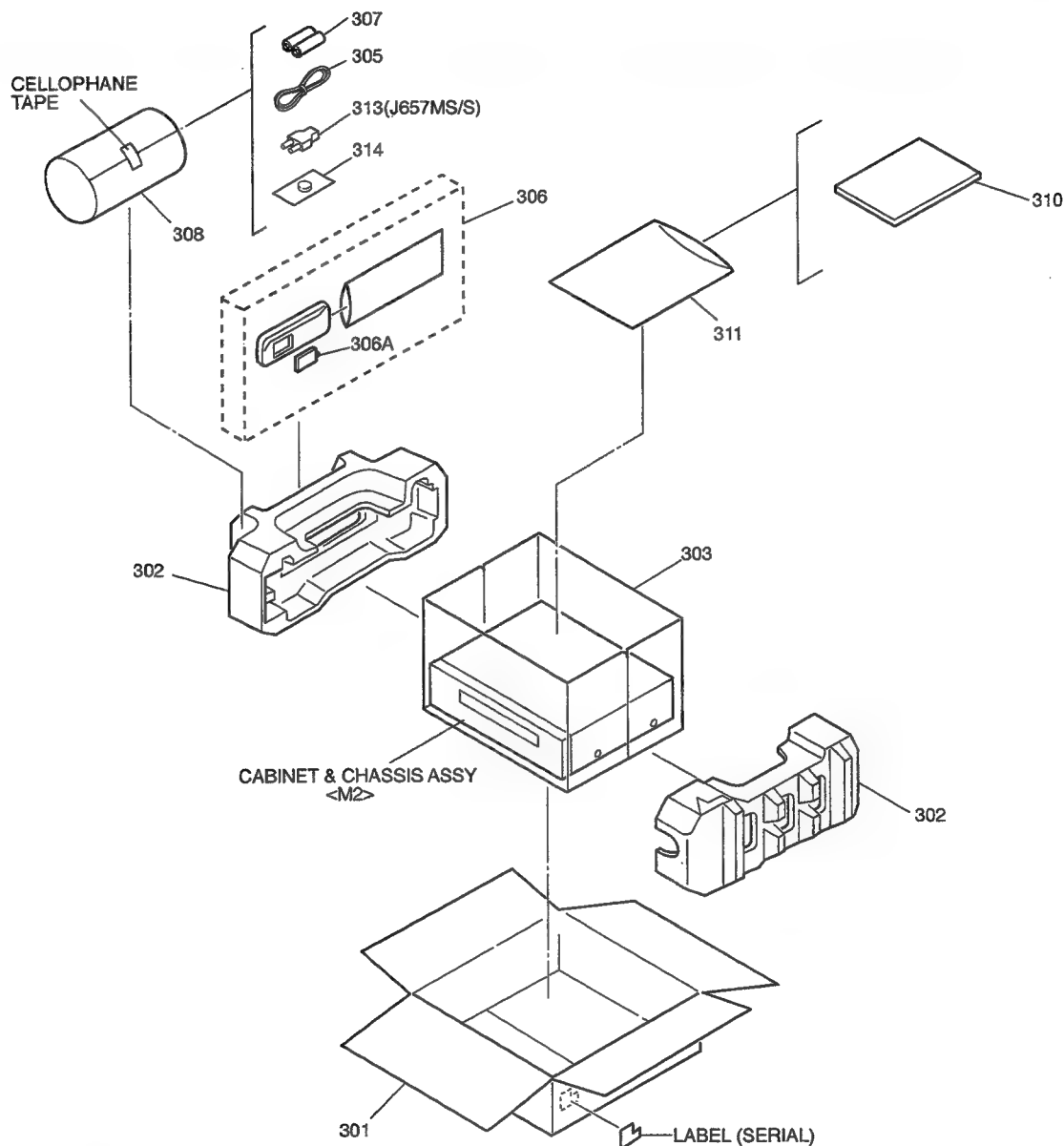
SECTION 5 PARTS LIST

SAFETY PRECAUTION

Parts identified by the \triangle symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.



#	\triangle	REF No.	PART No.	PART NAME, DESCRIPTION
---	-------------	---------	----------	------------------------

PACKING AND ACCESSORY ASSEMBLY <M1>

301	LP30423-035A	PACKING CASE
302	LP30424-001D	CUSHION ASSY
303	PQM30021-93	POLY BAG
305	PU59168-7	RF CABLE
306	LP20337-008A	REMOTE CONTROLLER

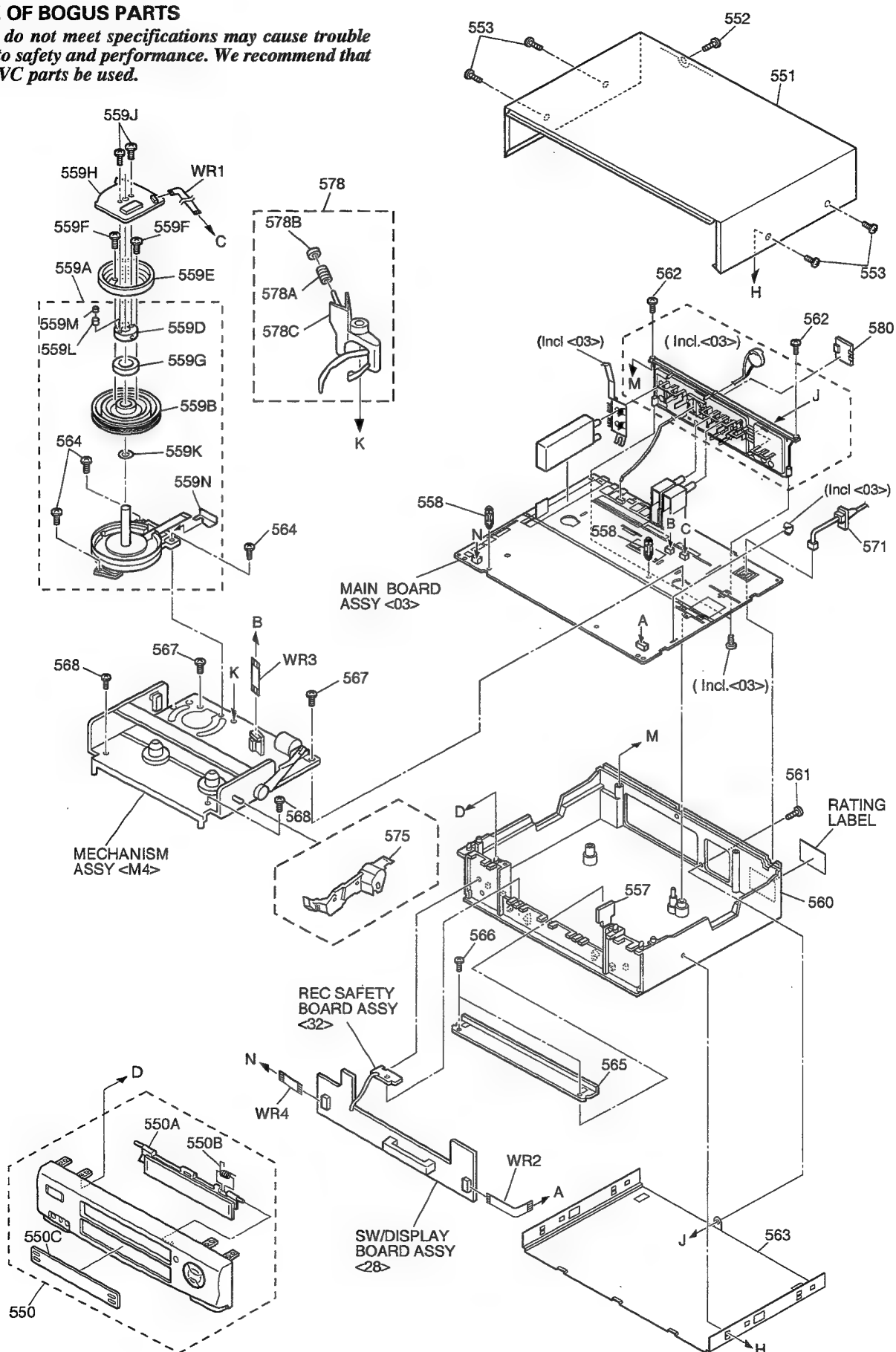
#	\triangle	REF No.	PART No.	PART NAME, DESCRIPTION
---	-------------	---------	----------	------------------------

		306A	LP40254-002B	COVER(BATTERY)
		307	-	BATTERY(R6P TYPE)
		308	QPC02202215P	POLY BAG
\triangle		310	LPT0109-001A	INST.BOOK(EN.CH)
\triangle			LPT0109-002A	INST.BOOK(RU.AR)
		311	QPC02503515P	POLY BAG
\triangle		313	PEMC1012	CONVERSION PLUG.J657MS/S
\triangle		314	PECA0903	LI BATTERY

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



△ REF No. PART No. PART NAME, DESCRIPTION

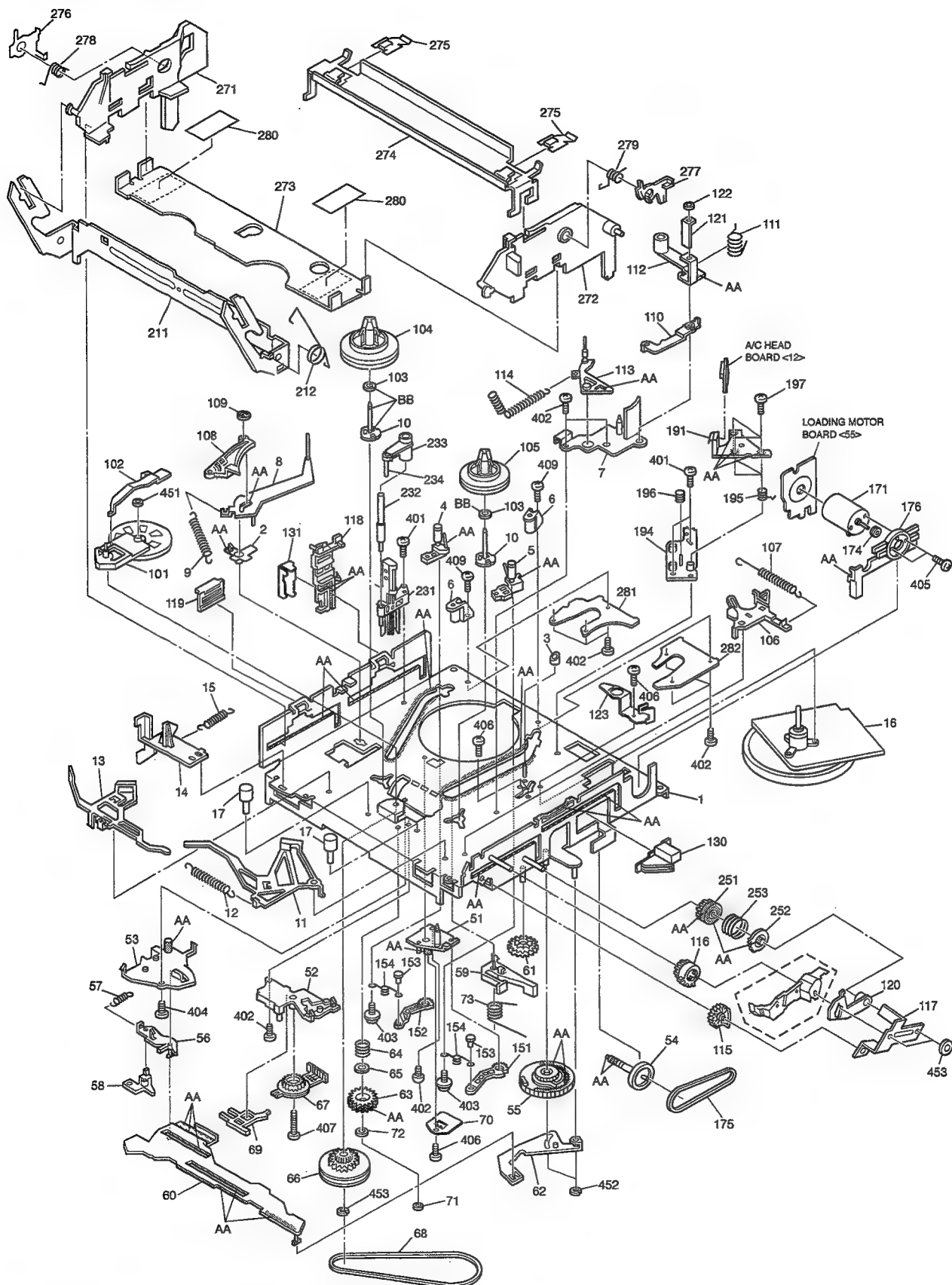
CABINET AND CHASSIS ASSEMBLY <M2>

△	550	LP10125-014E	FRONT PANEL ASSY,J657MS
		LP10125-019D	FRONT PANEL ASSY,J657MS/S
	550A	LP20342-016B	CASSETTE DOOR
	550B	PQ46448	TORSION SPRING
	550C	LP20343-016A	DISPLAY WINDOW
△	551	PQ11676-51	TOP COVER
	552	QYTDSF3010M	SCREW,TOP COVER(REAR)
	553	QYTDSF3010M	SCREW,X4 TOP COVER(SIDE)
	557	LP40441-001A	SPACER(MECHA)
	558	LP40226-001A	PC SUPPORT,X2
	559A	LP20289-002A	DRUM SUB ASSY
	559B	LP20030-002A	UPPER DRUM ASSY
	559D	LP40028-001A	COLLAR ASSY
	559E	PDZ0179	ROTOR ASSY
	559F	QYSPSP3006Z	SCREW,X2
	559G	PDM4439	CAP
	559H	PDZ0181-1-2	STATOR ASSY
	559J	QYSPSP2606Z	SCREW,X2
	559K	PDM4444-19-2	WASHER
	559L	LP40323-001A	CONTACT
	559M	LP30004-005A	COMPRESS.SPRING
	559N	LP40174-001B	FPC PLATE
△	560	LP10116-003C	BOTTOM CHASSIS
	561	QYTDSF3010M	SCREW,TERMINAL
	562	QYTDSF3010Z	SCREW,X2 TERMINAL
△	563	PQ11668-2-10	BOTTOM COVER
	564	QYTPST2608Z	SCREW,X3 DRUM
	565	LP30312-001B	BRACKET(CHASSIS)
	566	QYTDSF3010Z	SCREW,X2 BRACKET(CHASSIS)
	567	QYTDSF4012Z	SCREW,X2 MECHA
	568	QYTDSF3010Z	SCREW,X2 MECHA
△	571	QMP4A10-170	POWER CORD,J657MS
△		QMP73J0-170	POWER CORD,657MS/S
	575	LP20324-002B	DOOR OPENER
	578	LP40369-001B	CLEANER ASSY
	578A	PQ46418-1-2	CLEANER ROLLER
	578B	PQ46419-1-2	CLEANER
	578C	LP30407-001B	CLEANER ARM
	580	LP30336-001A	CAP,LT BATTERY
	WR1	QUQ212-0420CG	FFC WIRE,DRUM
	WR2	QUQ112-1214CG	FFC WIRE,DISPLAY
	WR3	WJT0005-002A	E-CARD WIRE,A/C HEAD
	WR4	QUQ212-0514CG	FFC WIRE,DISPLAY

△ REF No. PART No.

PART NAME, DESCRIPTION

5.3 MECHANISM ASSEMBLY <M4>



Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

#	△	REF No.	PART No.	PART NAME, DESCRIPTION	#	△	REF No.	PART No.	PART NAME, DESCRIPTION

MECHANISM ASSEMBLY <M4>									
1		LP20228-003D		MAIN DECK ASSY	119		LP40118-001A		RAIL CAP
2		LP30232-002A		T.ARM BEARING	120		LP30339-001A		OPENER GUIDE
3		LP40097-001B		G.POLE CAP	121		LP40382-001A		P.R. SHEET
4		LP40101-002A		P.BASE ASSY(S)	122		LP30016-002A		SLIT WASHER
5		LP40104-002A		P.BASE ASSY(T)	123		LP30482-001A		P.ROLLER GUIDE
6		LP30409-002A		UV CATCHER 2,X2	130		LP30493-001A		START SENSOR CAP
7		LP20234-001C		LID GUIDE	131		LP40457-001A		END SENSOR SHEET2
8		LP40108-001A		TENSION ARM ASSY	151		LP40103-002A		L.ARM GEAR(T)
9		LP30003-010A		TENSION SPRING	152		LP30224-001A		L.ARM GEAR(S)
10		LP40123-001A		REEL SHAFT,X2	153		LP40100-001A		PIN,L.ARM GEAR(S)
11		LP40111-002B		MAIN BRAKE AY (TAKE-UP)			LP40100-001A		PIN,L.ARM GEAR(T)
12		LP30003-002A		TENSION SPRING	154		LP40099-001A		TORSION ARM,L.ARM GEAR(S)
13		LP40110-002D		MAIN BRAKE ASSY (SUPPLY)			LP40099-001A		TORSION ARM,L.ARM.GEAR(T)
14		LP30245-001C		REC SAFTY LEVER	171		QAR0023-001		LOADING MOTOR
15		LP30003-004A		TENSION SPRING	174		PQ43546-1-2		MOTOR PULLEY
16		QAR0032-003		CAPSTAN MOTOR	175		LP30005-003A		BELT,LOADING MOTOR
17		PQ46302-1-3		ADJUST PIN,X2	176		LP30230-001B		MOTOR GUIDE
51		LP30223-003B		L.A.GEAR SHAFT	191		QAH0010-002		AC HEAD
52		LP20233-003B		R.ENCODER GUIDE	194		LP30228-001A		HEAD BASE
53		LP30226-003B		CTL.PLATE GUIDE	195		LP30004-012A		COMPRES.SPRING X3
54		LP40120-001A		WORM GEAR	196		LP40236-001A		COMPRESSION SPRING
55		LP30229-001B		CTL.CAM	197		LP40213-002B		SPECIAL SCREW,X3
56		LP30249-003B		T.UP LEVER	211		LP20240-001B		DRIVE ARM
57		LP30003-006A		TENSION SPRING	212		LP40137-001A		TORSION SPRING
58		LP40119-002A		T.UP HEAD	231		NAH0001-001		FULL ERASE HEAD
59		LP40113-001A		C.BRAKE ASSY	232		LP40098-001B		GUIDE POLE(S)
60		LP10080-002E		CTL.PLATE	233		LP30459-001A		T.STUD BASE
61		LP30237-002A		CASSETTE GEAR	234		LP40367-001A		TENSION STUD
62		LP40107-002A		LINK LEVER ASSY	251		LP30239-002E		LIMIT GEAR(1)
63		LP40122-001A		DIRECT GEAR	252		LP30240-002C		LIMIT GEAR(2)
64		LP40224-001C		COMPRESSION SPRING	253		LP40136-001D		TORSION SPRING
65		LP30017-002A		SPACER,D.GEAR	271		LP10081-001C		SIDE HOLDER(L)
66		LP40115-002C		CLUTCH UNIT	272		LP40403-001B		S.HOLDER(R)ASSY
67		QSW0554-002		ROTARY ENCODER	273		LP30257-001C		CASSETTE HOLDER
68		LP30005-005A		BELT,CAP.MOTOR	274		LP20241-001C		TOP PLATE
69		LP30235-002A		CHANGE LEVER	275		LP30258-001B		SPRING PLATE,X2
70		LP40379-001A		CTL BRACKET(1)	276		LP30255-001F		LOCK LEVER(L)
71		LP30016-001A		SLIT WASHER	277		LP30256-001D		LOCK LEVER(R)
72		LP30017-009A		SPACER,D.GEAR	278		LP40168-001A		TOR.SPRING(L)
73		LP40355-002A		TORSION SPRING	279		LP40218-001B		TOR.SPRING(R)
101		LP40114-002D		IDLER ARM ASSY	280		LP30019-006C		PAD,X2
102		LP30236-002A		IDLER LEVER	281		LP40275-001A		PLATE(S)
103		LP30017-004A		SPACER,REEL DISK	282		LP40276-001A		PLATE(T)
104		LP20237-001B		REEL DISK (SUPPLY)	401		QYTDST2608Z		SCREW,FE.HEAD
105		LP20238-001B		REEL DISK (TAKE-UP)			QYTDST2608Z		SCREW,X2 HEAD BASE
106		LP40112-001D		S.BRAKE(T)ASSY	402		QYTDST2606Z		SCREW,X6 PLATE(S)(T)
107		LP40357-001B		TENSION SPRING			QYTDST2606Z		SCREW,L.A.GEAR
108		LP40109-002C		T.BRAKE ASSY			QYTDST2606Z		SCREW,R.ENCODER GUIDE
109		PQ46302-1-3		ADJUST PIN			QYTDST2606Z		SCREW,X2 LID GUIDE
110		LP40149-001B		P.LEVER ASSY	403		QYSPSTG2606Z		SCREW,POLE BASE(S)
111		LP40148-001A		TORSION SPRING			QYSPSTG2606Z		SCREW,P.BASE(T)
112		LP40105-001A		P.R.ARM ASSY	404		QYTPST2605Z		SCREW,CTL.PLATE GUIDE
113		LP40106-001B		GUIDE ARM ASSY	405		QYTPSP3003Z		SCREW,X2 LOADING MOTOR
114		LP40134-001B		TENSION SPRING	406		QYTDSP2608M		SCREW,CTL BRACKET(1)
115		LP30243-001B		DRIVE GEAR			QYTDSP2608M		SCREW,X3 CAP.MOTOR
116		LP30242-001A		RELAY GEAR	407		QYTPST2620Z		SCREW,R.ENCODER
117		LP40214-001A		C.H.BRACKET	409		QYTPST2606Z		SCREW,X2 UV CATCHER
118		LP30244-001D		GUIDE RAIL	451		LP30016-001A		SLIT WASHER,IDLER ARM
					452		PQM30017-24		SLIT WASHER,CTL.CAM
							PQM30017-24		SLIT WASHER,LINK LEVER
					453		PQM30017-47		SLIT WASHER,CLUTCH GEAR
							PQM30017-47		SLIT WASHER,X2 C.H.BRACKET

5.4 ELECTRICAL PARTS LIST

#	△	REF No.	PART No.	PART NAME, DESCRIPTION

MAIN BOARD ASSEMBLY <03>				
		PW1	LPA10014-12B	MAIN BOARD ASSY
		IC1	JCP8016-MSA	IC
			or JCP8016-MSB	IC
		IC201	LC74789N-9718	IC (OSD)
		IC2201	AN3665FB-A	IC
△		IC2251	AN3328S	IC
		IC3001	HD6433928TB21F	QFP IC (MCU)
		IC3002	TA7291S	IC
		IC3003	S-80728AN-DR-X	IC
		IC3004	M24C08-BN6	IC
			or X24C08P	IC
			or AT24C08-10PC	IC
			or 24LC08B/P	IC
		IC3301	HD6433926TB28F	QFP IC (MCU)
		IC4001	BU2885CS	IC
		Q26	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q38	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q39	2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q152	2SB1218A/QR/-X	TRANSISTOR
			or 2SA1576A/QRS/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q203	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2001	2SC4081/QRS/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2002	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
		Q2003	DTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
			or UN511E	TRANSISTOR
		Q2051	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
		Q2052	2SA1576A/QR/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q2053	DTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
			or UN521E	TRANSISTOR
		Q2054	2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
		Q2055	DTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
			or UN521E	TRANSISTOR
		Q2251	DTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
			or UN511E	TRANSISTOR
		Q2254	DTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR

#	△	REF No.	PART No.	PART NAME, DESCRIPTION
			or UN5211	TRANSISTOR
		Q2255	DTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
			or UN511E	TRANSISTOR
		Q3001	PTZ-NV16	PHOTO TRANSISTOR
			or PTZ-NV09	PHOTO TRANSISTOR
		Q3002	PTZ-NV16	PHOTO TRANSISTOR
			or PTZ-NV09	PHOTO TRANSISTOR
		Q3003	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q3005	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		Q4201	2SC4081/RS/-X	TRANSISTOR
		Q5101	2SK2632-CB14	POWER MOS FET
			or 2SK2666F04	FE TRANSISTOR
			or 2SK2129-LT	POWER MOS FET
		Q5102	2SD2144S/UV/-T	TRANSISTOR
		Q5304	UN5211	TRANSISTOR
			or DTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR
		Q5305	2SC1740S/RS/-T	TRANSISTOR
			or 2SC3199/YG/-T	TRANSISTOR
		Q5306	2SD2144S/UVW/-T	TRANSISTOR
		Q5315	2SD2061/F/-	TRANSISTOR
		Q5316	2SD1819A/RS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/RS/-X	TRANSISTOR
		Q5319	2SC3616/ML/-T	TRANSISTOR
		Q5320	UN5111	TRANSISTOR
			or RN2302	TRANSISTOR
			or DTA114EU	TRANSISTOR
		Q5451	2SB927/ST/-T	TRANSISTOR
		Q5452	DTC144EU	TRANSISTOR
		Q6033	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
		Q6035	UN5211	TRANSISTOR
			or DTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR
		Q7162	2SB1218A/QR/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		D201	1N4148M	DIODE
			or 1SS133	DIODE
		D202	1N4148M	DIODE
			or 1SS133	DIODE
		D2001	1N4148M	DIODE
			or 1SS133	DIODE
		D2201	11ES2	DIODE
		D2253	DAP202U	DIODE
		D3001	LNB2301L01VI	LE DIODE
		D3002	11ES2	DIODE
		D3003	11ES2	DIODE
△		D3004	RB721Q	DIODE
		D3005	RD39ES/B3/-T2	ZENER DIODE
			or UZ39BSC	ZENER DIODE
			or MTZJ39C	ZENER DIODE
		D3007	1SS133	DIODE
			or 1N4148M	DIODE

#	△	REF No.	PART No.	PART NAME, DESCRIPTION	#	△	REF No.	PART No.	PART NAME, DESCRIPTION	
		D3008	1SS133	DIODE			R2	NRSA02J-561X	MG RESISTOR	560Ω, 1/10W
			or 1N4148M	DIODE			R3	NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
		D3009	1SS133	DIODE			R7	NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
			or 1N4148M	DIODE			R9	NRSA02J-333X	MG RESISTOR	33kΩ, 1/10W
		D5001	S1WB(A)60F4102	BRIDGE DIODE			R13	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or S1WB(A)60F4072X	BRIDGE DIODE			R14	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or S1WB(A)60F4062X	BRIDGE DIODE			R15	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
		D5101	AU01	FR DIODE			R16	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or ERA18-04-T2	FR DIODE			R17	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or PG104RS	FR DIODE			R18	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or 10ELS4	FR DIODE			R19	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or 1SR153-400-T2	FR DIODE			R23	NRSA02J-822X	MG RESISTOR	8.2kΩ, 1/10W
		D5102	AU01	FR DIODE			R24	NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W
			or ERA18-04-T2	FR DIODE			R25	NRSA02J-152X	MG RESISTOR	1.5kΩ, 1/10W
			or PG104RS	FR DIODE			R52	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or 1SR153-400-T2	FR DIODE			R56	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or 10ELS4	FR DIODE			R57	NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
		D5103	1N4148M	DIODE			R60	NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W
			or 1SS133	DIODE			R61	NRSA02J-153X	MG RESISTOR	15kΩ, 1/10W
		D5201	ERA18-02-T2	FR DIODE			R62	NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
			or 1SR153-400-T2	FR DIODE			R68	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
		D5202	FML-12S	FR DIODE			R69	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or FCF06A20	FR DIODE			R73	NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W
			or MA644	FR DIODE			R95	NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
			or YG901C2	FR DIODE			R96	NRSA02J-154X	MG RESISTOR	150kΩ, 1/10W
		D5206	FMB-24	BARRIER DIODE			R97	NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
			or F5KQ40B	BARRIER DIODE			R98	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
			or MA7D49	SB DIODE			R99	NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
			or YG801C04	SB DIODE			R120	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
		D5210	AU01Z	FR DIODE			R121	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or PG104RS	FR DIODE			R122	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W
			or 10ELS2	FR DIODE			R123	NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
			or ERA18-02-T2	FR DIODE			R124	NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
			or 1SR153-400-T2	FR DIODE			R133	NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W
		D5211	AU01Z	FR DIODE			R138	NRSA02J-392X	MG RESISTOR	3.9kΩ, 1/10W
			or ERA18-02-T2	FR DIODE			R143	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
			or 1SR153-400-T2	FR DIODE			R150	NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W
			or 10ELS2	FR DIODE			R201	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
			or PG104RS	FR DIODE			R204	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
		D5301	UZ15BSA	ZENER DIODE			R205	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
			or RD15ES/B1/-T2	ZENER DIODE			R206	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
			or MTZJ15A	ZENER DIODE			R208	NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W
		D5304	1N4148M	DIODE			R211	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
			or 1SS133	DIODE			R213	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W
		D5305	UZ30BSA	ZENER DIODE			R226	NRSA02J-182X	MG RESISTOR	1.8kΩ, 1/10W
			or RD30ES/B1/-T2	ZENER DIODE			R2001	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
			or MTZJ30A	ZENER DIODE			R2002	NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
		D5307	UZ6.2BSC	ZENER DIODE			R2003	NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W
			or MTZJ6.2C	ZENER DIODE			R2004	NRSA02J-224X	MG RESISTOR	220kΩ, 1/10W
			or RD6.2ES/B3/-T2	ZENER DIODE			R2005	NRSA02J-121X	MG RESISTOR	120Ω, 1/10W
		D5311	RD5.1JS/B2/-T2	ZENER DIODE			R2006	NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
			or MA4051N/M/-T2	ZENER DIODE			R2007	NRSA02J-223X	MG RESISTOR	22kΩ, 1/10W
		D5312	1N4148M	DIODE			R2013	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W
			or 1SS133	DIODE			R2016	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
		D5351	11E2-T5	DIODE			R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
		D5352	11E2-T5	DIODE			R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
		D5353	11E2-T5	DIODE			R2053	NRSA02J-822X	MG RESISTOR	8.2kΩ, 1/10W
		D5354	11E2-T5	DIODE			R2054	NRSA02J-123X	MG RESISTOR	12kΩ, 1/10W
		D6002	HZ30-2L-T2	ZENER DIODE			R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω, 1/10W
			or HZ30-2LTD	Z DIODE (M)			R2056	QRE141J-820Y	RESISTOR	82Ω, 1/4W
		R1	NRSA02J-0R0X	MG RESISTOR			R2057	NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W
										0Ω, 1/10W

#	△	REF No.	PART No.	PART NAME, DESCRIPTION		#	△	REF No.	PART No.	PART NAME, DESCRIPTION	
R2058			NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W	R3040			NRSA02J-152X	MG RESISTOR	1.5kΩ, 1/10W
R2059			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3041			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2060			NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W	R3042			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2202			NRSA02J-333X	MG RESISTOR	33kΩ, 1/10W	R3043			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2203			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3044			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2205			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3045			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2206			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3046			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2207			NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W	R3047			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2209			NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W	R3048			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2210			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3049			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2211			NRSA02J-511X	MG RESISTOR	510Ω, 1/10W	R3050			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2212			NCB21EK-683X	CAPACITOR	0.068μF, 25V	R3051			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2213			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3052			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2214			NRSA02J-511X	MG RESISTOR	510Ω, 1/10W	R3053			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2215			NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W	R3054			NRSA02J-272X	MG RESISTOR	2.7kΩ, 1/10W
R2217			NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W	R3055			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2218			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3056			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2219			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3057			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W
R2221			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W	R3058			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2222			NRSA02J-333X	MG RESISTOR	33kΩ, 1/10W	R3059			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W
R2223			NRSA02J-182X	MG RESISTOR	1.8kΩ, 1/10W	R3060			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2224			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W	R3061			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2225			NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	R3062			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2226			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3064			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2228			NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	R3067			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2229			NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	R3068			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2233			NRSA02J-203X	MG RESISTOR	20kΩ, 1/10W	R3069			NRSA02J-271X	MG RESISTOR	270Ω, 1/10W
R2234			NRSA02J-333X	MG RESISTOR	33kΩ, 1/10W	R3070			NRSA02J-271X	MG RESISTOR	270Ω, 1/10W
R2251			NRSA02J-101X	MG RESISTOR	100Ω, 1/10W	R3071			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2253			NRSA02J-270X	MG RESISTOR	27Ω, 1/10W	R3073			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2254			NRSA02J-220X	MG RESISTOR	22Ω, 1/10W	R3074			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2256			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3075			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2258			NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	R3076			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2259			NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W	R3077			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R2713			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3078			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R2714			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3079			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3001			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3080			NRSA02J-682X	MG RESISTOR	6.8kΩ, 1/10W
R3002			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3201			NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R3003			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3203			NRSA02J-562X	MG RESISTOR	5.6kΩ, 1/10W
R3004			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3204			NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W
R3010			NRSA02J-105X	MG RESISTOR	1MΩ, 1/10W	R3205			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3014			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3206			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3015			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3207			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3016			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3209			QRE141J-181Y	RESISTOR	180Ω, 1/4W
R3017			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3210			NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W
R3019			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3211			NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W
R3020			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3212			NRSA02J-181X	MG RESISTOR	180Ω, 1/10W
R3021			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3213			NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
R3022			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3214			NRSA02J-181X	MG RESISTOR	180Ω, 1/10W
R3023			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3215			NRSA02J-273X	MG RESISTOR	27kΩ, 1/10W
R3024			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3220			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3025			NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	△ R3222			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R3031			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3223			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3032			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3224			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3033			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3225			NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R3034			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3226			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3035			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3227			NRSA02J-393X	MG RESISTOR	39kΩ, 1/10W
R3036			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3228			NRSA02J-474X	MG RESISTOR	470kΩ, 1/10W
R3037			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3229			NRSA02J-334X	MG RESISTOR	330kΩ, 1/10W
R3038			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3230			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R3039			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R3231			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W

#	△	REF No.	PART No.	PART NAME, DESCRIPTION		#	△	REF No.	PART No.	PART NAME, DESCRIPTION	
R3232			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3373			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3233			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3374			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R3234			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3375			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
R3235			NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	R3376			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3236			NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	R3378			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3237			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3380			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W
R3238			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3501			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3239			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3502			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3240			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3503			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3241			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3504			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3242			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R3505			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3243			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3506			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3244			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3507			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3246			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R3508			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3249			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3509			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3250			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R3510			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3253			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R4001			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R3254			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R4003			NRSA02J-122X	MG RESISTOR	1.2kΩ, 1/10W
R3255			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W	R4005			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3256			NRSA02J-391X	MG RESISTOR	390Ω, 1/10W	R4007			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
R3257			NRSA02J-391X	MG RESISTOR	390Ω, 1/10W	R4008			NRSA02J-562X	MG RESISTOR	5.6kΩ, 1/10W
R3301			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R4009			NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W
R3302			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R4011			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3303			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R4012			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3304			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R4013			NRSA02J-562X	MG RESISTOR	5.6kΩ, 1/10W
R3310			NRSA02J-105X	MG RESISTOR	1MΩ, 1/10W	R4014			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
R3314			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R4015			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R3315			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R4201			NRSA02J-104X	MG RESISTOR	100kΩ, 1/10W
R3316			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R4202			NRSA02J-223X	MG RESISTOR	22kΩ, 1/10W
R3317			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R4203			NRSA02J-563X	MG RESISTOR	56kΩ, 1/10W
R3318			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5101			QRE141J-224Y	RESISTOR	220kΩ, 1/4W
R3319			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5102			QRE141J-224Y	RESISTOR	220kΩ, 1/4W
R3320			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5103			QRE141J-683Y	RESISTOR	68kΩ, 1/4W
R3321			NRSA02J-222X	MG RESISTOR	2.2kΩ, 1/10W	R5104			QRG029J-154G	OMF RESISTOR	150kΩ, 2W
R3322			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5106			QRT01DJ-R39X	MF RESISTOR	0.39Ω, 1W
R3323			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5107			QRE121J-331Y	RESISTOR	330Ω, 1/2W
R3324			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5108			NRSA02J-152X	MG RESISTOR	1.5kΩ, 1/10W
R3325			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5109			NRSA02J-681X	MG RESISTOR	680Ω, 1/10W
R3326			NRSA02J-332X	MG RESISTOR	3.3kΩ, 1/10W	R5110			NRSA02J-224X	MG RESISTOR	220kΩ, 1/10W
R3327			NRSA02J-332X	MG RESISTOR	3.3kΩ, 1/10W	R5111			NRSA02J-821X	MG RESISTOR	820Ω, 1/10W
R3331			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5301			NRSA02J-3R3X	MG RESISTOR	3.3Ω, 1/10W
R3343			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5302			NRSA02J-3R3X	MG RESISTOR	3.3Ω, 1/10W
R3344			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5303			NRSA02J-3R3X	MG RESISTOR	3.3Ω, 1/10W
R3345			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5304			NRSA02J-3R9X	MG RESISTOR	3.9Ω, 1/10W
R3346			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5307			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W
R3347			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5312			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R3348			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5313			NRSA02J-122X	MG RESISTOR	1.2kΩ, 1/10W
R3352			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	△ R5314			QRZ9005-101X	FUSI RESISTOR	10Ω, 1/4W
R3357			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5315			NRSA02J-122X	MG RESISTOR	1.2kΩ, 1/10W
R3358			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5316			QRA14CF-2211Y	CMF RESISTOR	2.21kΩ, 1/4W
R3359			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5317			QRA14CF-3481Y	CMF RESISTOR	3.48kΩ, 1/4W
R3360			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5319			QRE141J-511Y	RESISTOR	510Ω, 1/4W
R3361			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5320			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W
R3362			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5328			QRE141J-331Y	RESISTOR	330Ω, 1/4W
R3365			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5340			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W
R3366			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R5341			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W
R3367			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5342			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W
R3368			NRSA02J-102X	MG RESISTOR	1kΩ, 1/10W	R5343			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W
R3369			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5348			NRSA02J-471X	MG RESISTOR	470Ω, 1/10W
R3370			NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	R5349			NRSA02J-473X	MG RESISTOR	47kΩ, 1/10W
R3371			NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	R5451			NRSA02J-103X	MG RESISTOR	10kΩ, 1/10W

# Δ REF No.	PART No.	PART NAME, DESCRIPTION		# Δ REF No.	PART No.	PART NAME, DESCRIPTION	
R5452	QRE123J-331X	RESISTOR	330Ω, 1/2W	C58	NCB21EK-104X	CAPACITOR	0.1μF, 25V
R6020	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	C59	NCB21EK-104X	CAPACITOR	0.1μF, 25V
R6021	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	C61	NDC21HJ-390X	CAPACITOR	39pF, 50V
R6022	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	C62	NCB21EK-104X	CAPACITOR	0.1μF, 25V
R6023	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	C63	NDC21HJ-151X	CAPACITOR	150pF, 50V
R6032	NRSA02J-183X	MG RESISTOR	18kΩ, 1/10W	C64	QEKJ0JM-227	E CAPACITOR	220μF, 6.3V
R6033	NRSA02J-472X	MG RESISTOR	4.7kΩ, 1/10W	C65	NCB21EK-104X	CAPACITOR	0.1μF, 25V
R6035	NRSA02J-105X	MG RESISTOR	1MΩ, 1/10W	C81	NDC21HJ-150X	CAPACITOR	15pF, 50V
R6039	NRSA02J-105X	MG RESISTOR	1MΩ, 1/10W	C82	NDC21HJ-150X	CAPACITOR	15pF, 50V
R6051	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W	C83	NDC21HJ-150X	CAPACITOR	15pF, 50V
R6052	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W	C84	NDC21HJ-150X	CAPACITOR	15pF, 50V
R6054	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W	C91	NCB21EK-104X	CAPACITOR	0.1μF, 25V
R7161	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W	C98	NCB21HK-103X	CAPACITOR	0.01μF, 50V
R7162	NRSA02J-101X	MG RESISTOR	100Ω, 1/10W	C107	NDC21HJ-5R0X	CAPACITOR	5pF, 50V
R7163	NRSA02J-750X	MG RESISTOR	75Ω, 1/10W	C108	NCB21EK-104X	CAPACITOR	0.1μF, 25V
R7164	NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	C113	NDC21HJ-471X	CAPACITOR	470pF, 50V
R7165	NRSA02J-221X	MG RESISTOR	220Ω, 1/10W	C114	NCB21HK-223X	CAPACITOR	0.022μF, 50V
R7166	NRSA02J-750X	MG RESISTOR	75Ω, 1/10W	C118	NCB21CK-474X	CAPACITOR	0.47μF, 16V
R7168	NRSA02J-750X	MG RESISTOR	75Ω, 1/10W	C133	NCB21EK-104X	CAPACITOR	0.1μF, 25V
R7172	QRE121J-391Y	RESISTOR	390Ω, 1/2W	C134	NCB21HK-103X	CAPACITOR	0.01μF, 50V
R7174	NRSA02J-471X	MG RESISTOR	470Ω, 1/10W	C141	NCB21EK-104X	CAPACITOR	0.1μF, 25V
C1	QEK1CM-106	E CAPACITOR	10μF, 16V	C143	QEKJ0JM-476	E CAPACITOR	47μF, 6.3V
C3	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C164	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
C5	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C165	NRSA02J-0R0X	MG RESISTOR	0Ω, 1/10W
C6	NCB11EK-104X	CAPACITOR	0.1μF, 25V	C201	NDC21HJ-100X	CAPACITOR	10pF, 50V
C7	QEK1CM-107	E CAPACITOR	100μF, 6.3V	C203	NDC21HJ-330X	CAPACITOR	33pF, 50V
C9	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C204	NDC21HJ-330X	CAPACITOR	33pF, 50V
C11	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C207	NCB21CK-224X	CAPACITOR	0.22μF, 16V
C12	NCB21CK-473X	CAPACITOR	0.047μF, 16V	C209	NCB21CK-224X	CAPACITOR	0.22μF, 16V
C13	QEK1HM-335	E CAPACITOR	3.3μF, 50V	C211	QEKJ1HM-105	E CAPACITOR	1μF, 50V
C14	NCB21EK-333X	CAPACITOR	0.033μF, 25V	C213	QEKJ1HM-105	E CAPACITOR	1μF, 50V
C16	NCF21CZ-105X	CAPACITOR	1μF, 16V	C215	QEKJ0JM-227	E CAPACITOR	220μF, 6.3V
C17	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C258	NDC21HJ-560X	CAPACITOR	56pF, 50V
C20	NCF21CZ-225X	CAPACITOR	2.2μF, 16V	C2002	QEKJ1CM-476	E CAPACITOR	47μF, 16V
C21	NCB21EK-104X	CAPACITOR	0.1μF, 25V	C2003	NCB21HK-123X	CAPACITOR	0.012μF, 50V
C23	NCB21HK-223X	CAPACITOR	0.022μF, 50V	C2004	QEKJ1CM-226	E CAPACITOR	22μF, 16V
C24	NCB21CK-474X	CAPACITOR	0.47μF, 16V	C2005	NCB21HK-102X	CAPACITOR	0.001μF, 50V
C25	NCB21EK-104X	CAPACITOR	0.1μF, 25V	C2006	NCB21HK-331X	CAPACITOR	330pF, 50V
C29	NBE20JM-475X	T CAPACITOR	4.7μF, 6.3V	C2007	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C30	NBE20JM-475X	T CAPACITOR	4.7μF, 6.3V	C2008	NCB21HK-152X	CAPACITOR	0.0015μF, 50V
C31	NCB21HK-223X	CAPACITOR	0.022μF, 50V	C2009	QEKJ1EM-475	E CAPACITOR	4.7μF, 25V
C32	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C2010	QEKJ1EM-475	E CAPACITOR	4.7μF, 25V
C34	NCB21EK-104X	CAPACITOR	0.1μF, 25V	C2013	NCB21EK-333X	CAPACITOR	0.033μF, 25V
C35	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C2015	QEKJ1CM-226	E CAPACITOR	22μF, 16V
C37	QEKJ0JM-476	E CAPACITOR	47μF, 6.3V	C2016	QEKJ1EM-475	E CAPACITOR	4.7μF, 25V
C41	NCB21EK-104X	CAPACITOR	0.1μF, 25V	C2051	NCB21HK-331X	CAPACITOR	330pF, 50V
C42	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C2052	QFV61HJ-823	F CAPACITOR	0.082μF, 50V
C43	NCB21HK-103X	CAPACITOR	0.01μF, 50V	C2053	NCB21HK-472X	CAPACITOR	0.0047μF, 50V
C44	NDC21HJ-101X	CAPACITOR	100pF, 50V	C2054	NCB21EK-223X	CAPACITOR	0.022μF, 25V
C45	NCB21EK-104X	CAPACITOR	0.1μF, 25V	C2055	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C46	NDC21HJ-101X	CAPACITOR	100pF, 50V	C2202	QETC1CM-226	E CAPACITOR	22μF, 16V
C47	NCB21EK-104X	CAPACITOR	0.1μF, 25V	C2207	NCB21CK-473X	CAPACITOR	0.047μF, 16V
C48	QEKJ0JM-476	E CAPACITOR	47μF, 6.3V	C2208	QETC1CM-476	E CAPACITOR	47μF, 16V
C49	NDC21HJ-331X	CAPACITOR	330pF, 50V	C2209	QETC1HM-225	E CAPACITOR	2.2μF, 50V
C51	QEKJ1HM-105	E CAPACITOR	1μF, 50V	C2210	QETC1CM-476	E CAPACITOR	47μF, 16V
C52	QEKJ1HM-105	E CAPACITOR	1μF, 50V	C2211	NCB21HK-153X	CAPACITOR	0.015μF, 50V
C53	QEKJ1HM-105	E CAPACITOR	1μF, 50V	C2212	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C54	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V	C2213	QEKJ1EM-475	E CAPACITOR	4.7μF, 25V
C55	QEKJ1CM-106	E CAPACITOR	10μF, 16V	C2214	NCB21HK-103X	CAPACITOR	0.01μF, 50V
C56	QEKJ1HM-335	E CAPACITOR	3.3μF, 50V	C2216	QEKJ1EM-475	E CAPACITOR	4.7μF, 25V
C57	NCB21EK-104X	CAPACITOR	0.1μF, 25V	C2217	NCB21HK-103X	CAPACITOR	0.01μF, 50V

#	△	REF No.	PART No.	PART NAME, DESCRIPTION		#	△	REF No.	PART No.	PART NAME, DESCRIPTION		
			C2218	NCB21HK-153X	CAPACITOR	0.015μF,50V			C5006	QE20374-826	E CAPACITOR	82μF,400V
			C2219	QETC1CM-476	E CAPACITOR	47μF,16V			C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
			C2220	QETC1HM-225	E CAPACITOR	2.2μF,50V			C5102	QCZ0302-330Z	CAPACITOR	33pF,1kV
			C2221	NCB21CK-473X	CAPACITOR	0.047μF,16V			C5104	QETC1HM-105	E CAPACITOR	1μF,50V
			C2222	QEKJ1CM-476	E CAPACITOR	47μF,16V			C5105	QFN31HJ-183	F CAPACITOR	0.018μF,50V
			C2227	QEKJ1HM-224	E CAPACITOR	0.22μF,50V			C5106	QCB1HJ-271	CAPACITOR	270pF,50V
			C2228	QEKJ1CM-476	E CAPACITOR	47μF,16V			C5107	QFVF1HJ-104Z	F CAPACITOR	0.1μF,50V
			C2229	QEKJ1CM-226	E CAPACITOR	22μF,16V			C5201	QEMU0JM-227	E CAPACITOR	220μF,6.3V
			C2230	QEKJ1CM-106	E CAPACITOR	10μF,16V			C5202	QEMT1CM-827	E CAPACITOR	820μF,16V
			C2231	QETC1HM-106	E CAPACITOR	10μF,50V			C5203	QETC1CM-227	E CAPACITOR	220μF,16V
			C2232	QETC1HM-106	E CAPACITOR	10μF,50V			C5204	QEMT1AM-687	E CAPACITOR	680μF,10V
			C2233	QEKJ1HM-105	E CAPACITOR	1μF,50V			C5205	QETC1AM-227	E CAPACITOR	220μF,10V
			C2234	QEKJ1HM-105	E CAPACITOR	1μF,50V			C5207	QETC1JM-106	E CAPACITOR	10μF,63V
			C2236	QEKJ1CM-476	E CAPACITOR	47μF,16V			C5208	QETC1HM-106	E CAPACITOR	10μF,50V
			C2239	NCB21EK-104X	CAPACITOR	0.1μF,25V			C5301	QETC1AM-107	E CAPACITOR	100μF,10V
			C2251	NCB21HK-103X	CAPACITOR	0.01μF,50V			C5302	QETC1HM-106	E CAPACITOR	10μF,50V
			C2252	NCB21HK-103X	CAPACITOR	0.01μF,50V			C5303	QETC1CM-107	E CAPACITOR	100μF,16V
			C2253	NCB21HK-103X	CAPACITOR	0.01μF,50V			C5306	NCF21HZ-103X	CAPACITOR	0.01μF,50V
			C2254	QEKJ1CM-476	E CAPACITOR	47μF,16V			C5307	QETC1HM-474	E CAPACITOR	0.47μF,50V
			C2255	NCB21CK-104X	CAPACITOR	0.1μF,16V			C5308	NCB21HK-102X	CAPACITOR	0.001μF,50V
			C2256	NDC21HJ-101X	CAPACITOR	100pF,50V			C5309	QETC1AM-107	E CAPACITOR	100μF,10V
			C2257	NCB21HK-103X	CAPACITOR	0.01μF,50V			C5310	QETC1CM-226	E CAPACITOR	22μF,16V
			C2258	NCB21HK-223X	CAPACITOR	0.022μF,50V			C6006	NCB21HK-471X	CAPACITOR	470pF,50V
			C2260	NDC21HJ-221X	CAPACITOR	220pF,50V			C6008	NCB21HK-103X	CAPACITOR	0.01μF,50V
			C2261	NCB21HK-103X	CAPACITOR	0.01μF,50V			C6012	QETN1AM-227	E CAPACITOR	220μF,10V
			C3001	QEKJ1CM-336	E CAPACITOR	33μF,16V			C6014	NCB21EK-473X	CAPACITOR	0.047μF,25V
			C3004	QETN0JM-108	E CAPACITOR	1000μF,6.3V			C6016	NCB21HK-471X	CAPACITOR	470pF,50V
			C3006	NCB21CK-473X	CAPACITOR	0.047μF,16V			C6020	NDC21HJ-101X	CAPACITOR	100pF,50V
			C3012	NDC21HJ-102X	CAPACITOR	0.001μF,50V			C6021	NDC21HJ-101X	CAPACITOR	100pF,50V
			C3015	QEKJ1CM-106	E CAPACITOR	10μF,16V			C6022	NDC21HJ-101X	CAPACITOR	100pF,50V
			C3016	NCB21HK-103X	CAPACITOR	0.01μF,50V			C6023	NCB21HK-471X	CAPACITOR	470pF,50V
			C3017	NDC21HJ-180X	CAPACITOR	18pF,50V			C6024	NCB21HK-471X	CAPACITOR	470pF,50V
			C3018	QAT7001-450Z	TRIM CAPACITOR,TIMER CLOCK				C6032	NCB21HK-153X	CAPACITOR	0.015μF,50V
			C3022	NCB21CK-473X	CAPACITOR	0.047μF,16V			C6036	NCB21HK-682X	CAPACITOR	0.0068μF,50V
			C3025	QEKJ1HM-106	E CAPACITOR	10μF,50V			C7169	QEKJ1CM-476	E CAPACITOR	47μF,16V
			C3026	NCB21HK-103X	CAPACITOR	0.01μF,50V			C7170	NCB21EK-103X	CAPACITOR	0.01μF,25V
			C3027	NCB21EK-104X	CAPACITOR	0.1μF,25V			C7171	QETC0JM-477	E CAPACITOR	470μF,6.3V
			C3034	NCB21HK-221X	CAPACITOR	220pF,50V			L1	QQL29BJ-100Z	COIL	10μH
			C3042	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W			L4	QQL29BJ-100Z	COIL	10μH
			C3043	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W			L7	QQL29BJ-100Z	COIL	10μH
			C3306	NCB21EK-104X	CAPACITOR	0.1μF,25V			L8	QQL071J-820Y	COIL	82μH
			C3307	NCB21EK-104X	CAPACITOR	0.1μF,25V			L9	QQL29BJ-100Z	COIL	10μH
			C4001	NDC21HJ-101X	CAPACITOR	100pF,50V			L18	PELN1203	COIL	12μH
			C4002	NCB21HK-102X	CAPACITOR	0.001μF,50V			L23	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
			C4004	NCB21HK-102X	CAPACITOR	0.001μF,50V			L202	QQL29BJ-330Z	COIL	33μH
			C4006	QEKJ1HM-105	E CAPACITOR	1μF,50V			L203	QQL29BJ-220Z	COIL	22μH
			C4007	NCB21EK-104X	CAPACITOR	0.1μF,25V			L204	QQL29BK-1R0Z	COIL	1μH
			C4008	NCB21EK-103X	CAPACITOR	0.01μF,25V			L252	QQL29BJ-220Z	COIL	22μH
			C4010	QEKJ1CM-106	E CAPACITOR	10μF,16V			L2251	QQL29BJ-100Z	COIL	10μH
			C4011	QEKJ0JM-107	E CAPACITOR	100μF,6.3V			L2252	QQL29BJ-151Z	COIL	150μH
			C4013	QEKJ1CM-106	E CAPACITOR	10μF,16V			L3003	QQL29BJ-100Z	COIL	10μH
			C4015	NCB21HK-222X	CAPACITOR	0.0022μF,50V			L5201	PELN1184	COIL	33μH
			C4017	NCB21CK-563X	CAPACITOR	0.056μF,16V			L5202	PELN1184	COIL	33μH
			C4018	NDC21HJ-221X	CAPACITOR	220pF,50V			L5301	QQL01BK-101Z	COIL	100μH
			C4201	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W			L6002	QQL29BK-1R0Z	COIL	1μH
			C4202	NDC21HJ-390X	CAPACITOR	39pF,50V			CF3001	QAX0356-001Z	RESONATOR	
			C4203	NDC21HJ-220X	CAPACITOR	22pF,50V			CF3301	QAX0356-001Z	RESONATOR	
			C4204	NCB21EK-103X	CAPACITOR	0.01μF,25V			X1	QAX0436-001	CRYSTAL RESONATOR	
			C4206	NDC21HJ-470X	CAPACITOR	47pF,50V			X2	QAX0435-001	CRYSTAL RESONATOR	
△			C5001	QFZ9051-683	F CAPACITOR	0.068μF,250V			X3001	QAX0445-001	CRYSTAL RESONATOR	
△			C5005	QCZ9071-222	CAPACITOR	0.0022μF,400V			X4201	PEVB0645	CRYSTAL RESONATOR	

#	△	REF No.	PART No.	PART NAME, DESCRIPTION	
		K5101	QQR0678-001Z	FERRITE BEAD	
		PC3001	GP3S123	PHOTOTRANSISTOR	
		PC3002	GP3S123	PHOTOTRANSISTOR	
△		PC5101	ON3171/R/	IC(PHOTO COUPLE)	
		T2051	PELN0832	OSC TRANSFORMER	
△		T5001	QQS0021-001	SW TRANSFORMER	
		TU6001	QAU0084-001	TUNER	
		TB1	LP30360-008B	TERMINAL BOARD ASSY	
		OT1	QYTDSF3008Z	SCREW,X2 TERMINAL	
		ET1	PQ21623-1-3	EARTH PLATE(RF),TUNER	
		ET2	PQ21623-3	EARTH PLATE(RF),REG	
		HD1	QNZ0032-001	BATTERY HOLDER,TERMINAL	
		WR1	ML-PU4017A	PARALLEL WIRE,TERMINAL	
		SD1	LP30364-001A	S.CASE(PRE/REC)	
		HS1	PQ45788-1-2	HEAT SINK,Q5101	
		OT2	QYTDSF3006Z	SCREW,Q5101	
△		F5001	QMF51E2-1R6J1	FUSE	T1.6A
		FC5001	QNG0006-001Z	FUSE CLIP,F5001	
		FC5002	QNG0006-001Z	FUSE CLIP,F5001	
		J7108	PU61012	MINI JACK,R.PAUSE I/O	
		J7161	PEMC1156	PIN JACK(SW),AV IN RCA	
		J7162	PEMC1157	PIN JACK,AV OUT RCA	
△		LF5002	QQR0532-001	LINE FILTER	
		CN1	QGF1018C1-11	FPC CONNECTOR,(1-11)U.DRUM	
		CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
		CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
		CN3001	QGB2015M1-08	CONNECTOR,(1-8)CAP MOTOR	
		CN3003	QGB2532J1-02	CONNECTOR,(1-2)L.MOTOR	
		CN3004	QGB2534J2-04	CONNECTOR,(1-4)R.ENCODER	
		CN3005	QGF1207C1-12	FPC CONNECTOR,(1-12)SW DISPLAY	
		CN3008	QGD2001C1-02	CONNECTOR,(1-2)LT BATTERY	
		CN4001	QGF1207C1-04	FPC CONNECTOR,(1-4)DRUM MDA	
△		CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN	
		CN7162	QGF1207C1-05	FPC CONNECTOR,(1-5)FRONT	
△		CP3003	ICP-N20	CIRCUIT PROTECTOR	
△		CP4001	ICP-N15	CIRCUIT PROTECTOR	
△		CP5301	ICP-N38	CIRCUIT PROTECTOR	
△		CP5302	ICP-N25	CIRCUIT PROTECTOR	

AUDIO CONTROL HEAD BOARD ASSEMBLY <12>

PW1	LPA10010-01A1	A/C HEAD BOARD ASSY
CN1	QGF1208F1-07	FPC CONNECTOR

SW/DISPLAY BOARD ASSEMBLY <28>

PW1	LPA10018-18A1	DISPLAY BOARD ASSY
IC7001	M35500BFP	IC
	or M35500BGP	IC
	or M35500AGP	IC
IC7002	PNA4652M00XB	IR DETECT UNIT
	or GP1U281X	IR DETECT UNIT
D7002	RD9.1ES/B2/-T2	ZENER DIODE

#	△	REF No.	PART No.	PART NAME, DESCRIPTION	
			or UZ9.1BSB	ZENER DIODE	
			or MTZJ9.1B	ZENER DIODE	
		R7001	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7002	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7003	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7004	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7005	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7006	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7007	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7008	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7013	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7014	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
		R7015	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
		R7020	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7021	QRE141J-122Y	RESISTOR	1.2kΩ,1/4W
		R7022	QRE141J-182Y	RESISTOR	1.8kΩ,1/4W
		R7023	QRE141J-222Y	RESISTOR	2.2kΩ,1/4W
		R7024	QRE141J-272Y	RESISTOR	2.7kΩ,1/4W
		R7025	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R7026	QRE141J-682Y	RESISTOR	6.8kΩ,1/4W
		R7027	QRE141J-153Y	RESISTOR	15kΩ,1/4W
		R7028	QRE141J-393Y	RESISTOR	39kΩ,1/4W
		R7030	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7031	QRE141J-122Y	RESISTOR	1.2kΩ,1/4W
		R7032	QRE141J-182Y	RESISTOR	1.8kΩ,1/4W
		R7033	QRE141J-222Y	RESISTOR	2.2kΩ,1/4W
		R7034	QRE141J-272Y	RESISTOR	2.7kΩ,1/4W
		R7035	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R7036	QRE141J-682Y	RESISTOR	6.8kΩ,1/4W
		R7037	QRE141J-153Y	RESISTOR	15kΩ,1/4W
		R7038	QRE141J-393Y	RESISTOR	39kΩ,1/4W
		R7052	QRE141J-393Y	RESISTOR	39kΩ,1/4W
		C7001	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7002	QEK01HM-106	E CAPACITOR	10μF,50V
		C7007	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7008	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7009	QCSB1HJ-150	CAPACITOR	15pF,50V
		C7010	QCFB1HZ-104	CAPACITOR	0.1μF,50V
		C7011	QEKJ0JM-227	E CAPACITOR	220μF,6.3V
		S7001	QSW0456-002Z	TACT SWITCH,POWER	
		S7002	QSW0456-002Z	TACT SWITCH,CH+	
		S7003	QSW0456-002Z	TACT SWITCH,CH-	
		S7004	QSW0456-002Z	TACT SWITCH,REC	
		S7005	QSW0456-002Z	TACT SWITCH,PAUSE	
		S7006	QSW0456-002Z	TACT SWITCH,PLAY	
		S7007	QSW0456-002Z	TACT SWITCH,STOP/EJECT	
		S7008	QSW0456-002Z	TACT SWITCH,FF	
		S7009	QSW0456-002Z	TACT SWITCH,REW	
		S7010	QSW0456-002Z	TACT SWITCH,SIMUL	
		S7011	QSW0456-002Z	TACT SWITCH,SP/LP/EP	
		S7012	QSW0456-002Z	TACT SWITCH,C.RESET	
		S7013	QSW0456-002Z	TACT SWITCH,ST BOX	
		S7014	QSW0456-002Z	TACT SWITCH,COL.SYS	
		S7015	QSW0456-002Z	TACT SWITCH,REVIEW	
		S7016	QSW0456-002Z	TACT SWITCH,P.JOG-	
		S7017	QSW0456-002Z	TACT SWITCH,P.JOG+	
		FW7001	QUM032-07A4A4	PARA RIBON WIRE	
		J7191	PEMC1126	PIN JACK,VIDEO IN	
		J7192	PEMC0922	PIN JACK(SW),AUDIO(L)IN	
		J7193	PEMC0922	PIN JACK(SW),AUDIO(R)IN	
		DI7001	QLF0032-002	FL TUBE	

#	△	REF No.	PART No.	PART NAME, DESCRIPTION
		HD1	PQ34668	FDP HOLDER(L),DI7001
		HD2	PQ34669	FDP HOLDER(R),DI7001
		OT1	LP30002-052A	SPACER,X2
		CN7001	QGF1208C1-12	FPC CONNECTOR,(1-12)MAIN
		CN7191	QGF1207C1-05	FPC CONNECTOR,(1-5)MAIN

REC SAFETY BOARD ASSEMBLY <32>

PW2	LPA10018-01B2	REC SAFETY BOARD ASSY
S7041	QSW0602-002	PUSH SWITCH

LOADING MOTOR BOARD ASSEMBLY <55>

PW2	LPA10010-01A2	L.MOTOR BOARD ASSY
CN1	QGB2533K1-02	CONNECTOR

#	△	REF No.	PART No.	PART NAME, DESCRIPTION
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